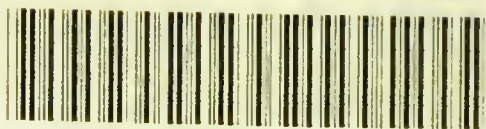




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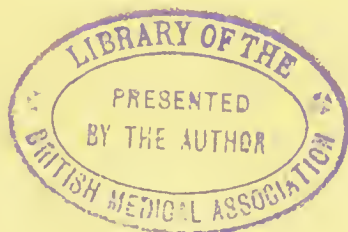
*by
Hubert R. Spencer*

March 3, 1927

*This is a specially bound copy of the
paper published in the
Transactions of the Obstetrical Society of London*

Vol XXXIII (Jan 1891)

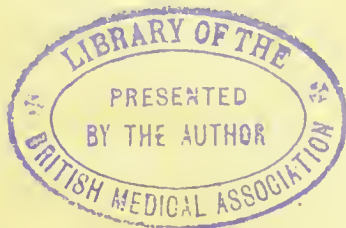
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ON VISCERAL HÆMORRHAGES IN STILLBORN CHILDREN. AN ANALYSIS OF 130 AUTOPSIES ; BEING A CONTRIBUTION TO THE STUDY OF THE CAUSATION OF STILLBIRTH.

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(Received December 13th, 1890.)

(Abstract.)

THE author gives a detailed account of a consecutive series of 130 autopsies on fresh, mostly stillborn, fetuses, in so far as congestion of, and hæmorrhage into, the viscera are concerned. Appended are tables of the more important organs affected.

The main part of the paper consists of a description of the naked-eye and microscopic appearances of the various viscera as regards congestion and hæmorrhage.

The causation of the hæmorrhage is discussed, and the following practical conclusions are drawn :

1. In children stillborn, or dying shortly after birth, congestion or œdema and hæmorrhages are usually found in various important viscera.

2. These hæmorrhages occur in cases delivered naturally or by version or by forceps, through normal and abnormal pelves ; in primiparæ and multiparæ ; with large and small children ; in "easy" and difficult, rapid and prolonged labours.

3. The hæmorrhages are, however, most frequent and most severe in children subjected to much pressure by the parturient canal or instruments or the hand of the attendant, especially when delivered by the lower extremity.

4. Cerebral hæmorrhage is more frequently found in stillborn children delivered by the forceps than in those born by the breech, and in these latter more frequently than in those born naturally by the head.

5. Hæmorrhage into most of the other viscera is more frequently met with in pelvic than in cephalic presentations.

6. These hæmorrhages and the accompanying injuries are in many cases the cause of the stillbirth, and, when not immediately fatal, may be followed by the gravest consequences.

7. They are most likely to be avoided by preventing premature rupture of the membranes, by artificial dilatation of the parturient canal (when necessary), by restricting the employment of version and other artificial manipulations to urgent cases, and by preferring cephalic to podalic version in cases suitable for the former.

8. The use of the forceps should be absolutely limited to cases in which there exists some pressing danger to mother or child, and it should never be employed merely to shorten the time of labour.

9. In breech presentations, examination of the genital organs of the child should be carefully avoided during delivery. As soon as the child's limbs are born they should be wrapped in a thick layer of antiseptic wool (which keeps the child warm, and prevents the hand from slipping, and protects the limb from pressure). If traction be necessary, it should be made over wool wrapped around the child's limbs or pelvis; it should never be made by the hand around the child's waist.

10. In delivering the after-coming head, care should be taken that the sterno-mastoid muscles are not unduly stretched or pressed upon. When the after-coming head is in the pelvis, and there is even slight difficulty, resort should be had to the forceps to deliver.

INTRODUCTION.

FROM the 1st of August, 1887, to the 1st of June, 1890, 6088 women were delivered under my care in the outdoor Maternity Department of University College Hospital. I have made autopsies on all the children born "still" during that period, with the exception of a few cases in which I was unable to obtain the parents' consent. I have also examined the bodies of twenty-five children which lived only a few hours or a few days.

The total number of bodies examined is 180. Of these exactly fifty were in a more or less advanced state of intra-uterine maceration, and, while interesting from other points of view, have little bearing on the object of this paper, and are not included in it. The paper deals with the remaining 130 fresh fœtuses.

I am personally responsible for the whole of the work—post-mortem examinations, microscopic sections, and drawings. The plan of the present paper is—

PART I.—An epitomised account of each case in so far as congestion, œdema, and hæmorrhage are concerned.

PART II.—Tables of the injuries (as shown by congestion and hæmorrhage) in various important viscera.

PART III.—A description of the injuries to the viscera based on the above.

PART IV.—A discussion of the causation of the hæmorrhages.

PART V.—Some practical conclusions.

It being impossible for me to attend every labour in a large out-patient practice, I have only been able to give the more important features of the labour. Most of the difficult cases have, however, been attended by me. With the exception of the spinal cord and the intestinal tract all the viscera were carefully examined in every case. When an organ other than the spinal cord or intestinal

tract is not mentioned in the Abstract (Part I), it means that no congestion, œdema, or hæmorrhage was present. No special notice is take in this paper of pericranial hæmorrhage and œdema.

Out of the total number of 130 autopsies, 78 were on male, 49 on female children; in 3 the sex is not given.

The presentation and delivery are given in 105 cases.

As natural head presentations were delivered 43 cases (5 of these were face presentations).

„ breech or footling presentations were delivered 26 cases.	
As shoulder presentation (decapitation) was	„ 1 case.
„ „ (<i>conduplicato corpore</i>) was	„ 1 „
The forceps was employed to the head in	. 15 cases.
„ „ breech in	. 1 case.
Podalic version was employed in	. 13 cases.
Cephalotripsy	„ 7 „
Craniotomy for hydrocephalus was employed in	. 1 case.

Of the 43 cases which presented by the head, in 5 the presentation was a little doubtful, the child having been born before the medical attendant's arrival; the presentation has in these cases been inferred from the caput succedaneum. Of these 43 cases 5 presented by the face (one of these doubtful), of which 2 were anencephalous monsters.

Of the 26 cases presenting by the lower pole, in 5 (51, 56, 83, 126, 128) the legs were extended, and 4 were footling presentations.

The forceps was applied to the head five times for contracted pelvis, five times for tedious labour (once only was the head on the perinæum), three times for hæmorrhage, and twice for prolapse of the cord. The forceps was applied to the breech once, in a case of accidental hæmorrhage.

Version was employed seven times for placenta prævia, once for accidental hæmorrhage, once for contracted pelvis, once for prolapse of the cord and contracted pelvis, once for transverse presentation, once for shoulder presentation, and once for epilepsy in the mother.

PART I.—ABSTRACT OF CASES.

The following abbreviations are used:—Version=podalic version; hge.= hæmorrhage; cgn.=congestion; cgd.=congested; R.=right; L.=left; R.L.=right and left; M.=male; F.=female.

CASE 1.—F., 5 lbs. 9 oz.—*Breech presentation; tardy delivery; much traction used; heart beating when born; insuflated; never spontaneously breathed.*

Conjunctiva cgd., especially L. side. *Liver* much cgd., black-red. *Kidneys* much cgd., especially at bases of pyramids, on the R. side more than the L., which shows what appear to be small hges. at bases of pyramids.

CASE 2.—M., 5 lbs.—*A twin; transverse presentation; version; much traction; lived four days; was cold and blue till death from pneumonia, (?) caused by hge. into lungs.*

Stomach contains blood (? from lungs). *R. leg* much bruised (traction); hge. into the subcutaneous tissue; the deep veins of the leg normal; the leg was cold and almost black during life. *Lungs* large, heavy, deeply marked by ribs, solid at both bases, where they are black; at apices dark brown-red, less solid than at bases; frothy fluid exudes on squeezing. *Pleuræ* contain slight excess of fluid; pulmonary pleura opaque in patches.

CASE 3.—M., 8 lbs., 22 in.—*Multipara; first vertex presentation; prolapse of cord; labour lasted fourteen hours; forceps applied three times; child dead ten hours before the last application.*

Head shows abrasions and bruises in several places on R. side. Hge. into coronal suture. *Liver* has hge. on upper surface of L. lobe beneath capsule. *R. supra-renal* cgd. *Lungs*, hge. (subpleural) R.L. *Testicles* cgd. *Brain*, hge. around base.

CASE 4.—F., 3 lbs. $12\frac{1}{2}$ oz., $17\frac{1}{2}$ in.

Lungs, red-brown or black-brown spots scattered over the surface beneath the visceral pleura except at apex. *Heart*, dark red subpericardial petechia at coronary sinus. *Supra-renals* both distended with blood-clot; the blood has burst through the left organ, and has spread behind the kidney. *Kidneys* much cgd.; hge. into L. kidney, appearing as red patches on surface, and on section seen to extend into cortex. Cgn. of bases of pyramids. Hge. also in cortex of R. kidney in shape of dark red streaks. *Liver* cgd. *Skull*, bloody serum over vertex; hge. under periosteum of R. frontal and L. occipital bone; vessels of *meninges* cgd.

CASE 5.—F., 4 lbs. $10\frac{1}{2}$ oz., 17 in.—*Accidental hæmorrhage; version.*

There is a blue band a quarter of an inch wide round the thorax just below the middle (produced by cervix). Both arms are bruised. *Lungs* cgd., small hges. beneath visceral pleura. *Liver* much cgd. *Heart* has only two pulmonary and two aortic valves. *Supra-renals*, hge. into medulla. *Head*, isolated hges. (black) in cellular tissue of scalp; hges. under pericranium of frontal and parietal bones. *Meninges* cgd. Clear yellow fluid in *peritoneum* and *pleuræ*.

CASE 6.—M., 3 lbs. 8 oz., $17\frac{1}{2}$ in.—*A second twin delivered conduplicato corpore.*

Peritoneum contains blood-stained fluid. Slight blood-staining at parts of visceral *pleuræ*. *Liver* generally cgd. On the upper surface of each lobe near the anterior edge is a hge. (black), raising up the capsule for one-fifth of an inch in thickness and three-quarters of an inch in area; the outer edge of each hge. corresponds to the costal margin. *Supra-renals* much cgd. *Kidneys* cgd. *Scrotum*, hydrocele on R. side with bloody fluid, both cords much distended; spermatic veins very full; slight hge. into R.

cord. Both *testes* black (microscope shows much hge., Pl. V, fig. 3, and Pl. VI) ; slight hge. into *epididymis*. *Head*, œdema of scalp ; a little black hge. on L. side of apex of occipital bone ; *meninges* cgd.

CASE 7.—M., 3 lbs. 6 oz., 16½ in.—(?) *Breech presentation*.

Conjunctiva injected on L. side. *Liver* large, cgd., almost black in places. *Spleen* slightly cgd. *Kidneys* cgd., especially pyramids and at bases of these. *Supra-renals* slightly cgd. *Head*, no caput ; slight bruising of cellular tissue over both parietal bones, the periosteum of which appears nearly black on each side of the sagittal sutures from hge. beneath it. Veins of *pia mater* of brain much cgd. Cgn. of Y-shaped ligament of hip-joint.

CASE 8.—M.—*Cephalotripsy*.

All organs quite normal, pale, no cgn., no hge.

CASE 9.—M., 1 lb. 13½ oz., 13½ in.—*Placenta prævia, version, extraction*.

Lungs slightly cgd. at thin edge of base. *Scalp*, much œdema and red fluid. Small hge. under pericranium. Slight hge. into cellular tissue of *leg and foot*.

CASE 10.—F., 8 lbs., 21 in.—*Hydrocephalus, breech presentation, traction, supra-pubic pressure*.

Scalp, large quantity of blood-stained fluid escapes. *Pleuræ*, small quantity of blood-stained fluid ; a few ecchymoses on surface of *lungs*, especially at bases. *Heart* has ecchymoses along course of vessels, under visceral pericardium. *Abdomen* contains a large quantity of nearly pure blood, which comes from the R. lobe of the *liver*, which has been ruptured at its posterior part. *Supra-renal capsules*, R. ruptured, L. congested. *Kidneys* much cgd. ; subcapsular hge. in R. Hge. into *perinæum* and tissues of *labia majora*. *Head*, hge. under parietal pericranium ; none inside skull.

CASE 11.—F., 4 lbs. 15 oz.—*Accidental hæmorrhage ; forceps (child probably dead before application).*

Head, abrasion on forehead (forceps), black blood in cellular tissue of scalp, also under frontal, occipital and parietal pericranium. *Brain* cgd., no hge. *Larynx and trachea* much cgd. *Lungs* much cgd. ; subpleural hges. of slight extent, chiefly at bases and edges. *Thymus* cgd. *Peritoneum* cgd. *Pancreas* cgd. *Liver* cgd. *Supra-renals* slightly cgd. *Kidneys*, pyramids greatly cgd. *Uterus*, subperitoneal tissue cgd. *Fallopian tubes* cgd., especially at outer ends. Mucous membrane of *nasal fossæ* much cgd.

CASE 12.—M., 8 lbs., 21 in.—*Forceps.*

Bruise on R. side of *forehead* (forceps) and on L. side of *neck* (forceps) ; bruises on front of chest from injection of ether. Slight amount of bloody serum in caput, also under pericranium. *Brain* firm, vessels much cgd. on surface and in substance, small hge. at base, extending over *pons*, *medulla*, and *cerebellum* ; *choroid plexuses* full, and contain a clot which extends to base of brain. *Liver* large, cgd. *Spleen* enlarged, much cgd., almost black. *Supra-renals* cgd. *Kidneys* much cgd., especially lower end of L., which is almost black. *Spermatic veins* much enlarged on L. side. *Scrotum* appears to be bruised.

CASE 13.—F., 3 lbs. 4 oz., 15 in.—*Twin of multipara, two hours in labour ; second vertex.*

Lungs, lower lobe of R. much cgd., and exudes a bloody fluid ; L. lung similar, but to less extent. *Liver* much cgd. *Kidneys*, slight cgn. at bases of pyramids. *Spleen* cgd.

CASE 14.—M., 8 lbs. 4 oz.—*Accidental hæmorrhage ; forceps.*

Bruised patch on tip of nose (forceps), mark of blade on middle of brow. *Scalp* slightly thickened with blood-

clot. *Brain* cgd. *Kidneys* cgd., cortex mottled. *Liver* cgd. greatly on upper surface. *Spleen* much cgd.

CASE 15.—F., 6 lbs. 8 oz., 19½ in.—*Breech presentation* ; delivered, except head, half an hour before the arrival of attendant ; head easily delivered.

Finger-nails black. *Peritoneum* cgd., contains three drachms of clear yellow fluid. *Small intestine* and *rectum* cgd. *Stomach* shows the usual red specks on rugæ. *L. kidney* at its upper outer anterior part shows two greatly cgd. patches ; on section at this spot it seems bruised. *L. supra-renal* greatly cgd., and there is hge. into its medulla. *Liver* slightly cgd. *Heart*, subpericardial hges. at apex, also at bases of large vessels. Hge. into thin edge of lower lobe of *L. lung*, subpleural hges. scattered over lungs. *Uterus* and *ovaries* cgd. ; canal of cervix uteri congested for a length of one-sixth of an inch from external os. No œdema nor effused blood in scalp nor under pericranium ; considerable cgn. of vessels on surface of *brain*, a slight amount of hge. has occurred ; choroid plexuses much cgd.

CASE 16.—F., 4 lbs. 8 oz. (without head and neck).—*Neglected right shoulder presentation* ; *decapitation*.

A few hges. of the size of a pea in the cellular tissue of *scalp* ; no œdema. *Heart* has a small subpericardial hge. on the posterior surface of the base of the right ventricle. *Lungs* : R. weighs 360 gr., and is enormously cgd., solid and of a dark blue colour ; L. lung weighs 150 gr., and shows on surface slightly congested patches, but is generally of a pale pink colour. *Liver* much cgd. right lobe, and there is a small subcapsular hge. on the under surface of this lobe. *Kidneys* cgd. at bases of pyramids.

CASE 17.—F., 4 lbs. 13 oz., 17½ in.—*Natural vertex*, born half an hour before arrival of student ; *caul* over head. *Mother* had had four children born naturally.

Nails blue-black. *R. lung* has a subpleural hge. of

the size of a split bean at the base of the middle lobe. L. lung has a small subpleural hge. at thin edge of lower lobe. *Liver*, lower surface much cgd. There is a subcapsular hge. one quarter of an inch thick over the whole of the quadrate lobe. Between *R. kidney* and *R. supra-renal* is a hge.; hge. also appears externally at hilum of *R. kidney*. On section *R. kidney* shows hge. into hilum (Pl. III, fig. 2). *Supra-renals* not appreciably cgd. *Scalp* shows black blood effused into the cellular tissue at occiput; a considerable quantity of blood beneath pericranium. *Meninges* and choroid plexuses much cgd.

CASE 18.—M., 1 lb. 12½ oz., 14½ in.—*Accidental hæmorrhage; vertex presentation; suddenly delivered naturally through cervix, which just previously was rigid and of the size of half-a-crown.*

Scalp very red and œdematous posteriorly, over occipital bone. *Brain* cgd. on surface; hge. beneath dura mater at occipital bone; hge. into *lateral ventricle* *R. side*, and some also on *L.* *Conjunctiva* reddened. *Larynx* and *trachea* slightly reddened. *Abdomen* contains much blood. *Liver* ruptured on under surface, there being a subcapsular hge. as big as a shilling; the surface of the organ appears bruised in other places. *Kidneys* slightly cgd. between cortex and bases of pyramids. Hge. into each *processus vaginalis* and *spermatic cord*; the hge. can be seen as a blue stain through the skin of the inguinal region.

CASE 19.—M., 5 lbs. 12 oz., 19 in.—*A twin (with Case 20), born before the arrival of student.*

Scrotum and *tunica vaginalis* full of pale yellow fluid. *Lungs* cgd.; small petechiæ and hges. on surface and between lobes; the hge. is subpleural, and as thick as cardboard. *Kidneys* slightly cgd. at lower ends. *Liver* dark.

CASE 20.—F., 6 lbs. 9 oz., 19 in.

Meninges of brain cgd. *R. pleura* contains a few drops

of red fluid. Great cgn. of lower edges of *lungs*. *Kidneys* are both slightly cgd. at bases of pyramids, where there are several small punctate hges. The *skull* shows a few patches of dark black-red blood under the pericranium, but scarcely any in the cellular tissue of the scalp.

CASE 21.—M., 4 lbs. 11½ oz., 18 in.—*Born in the membranes twenty-five minutes before the arrival of student; said to have "fluttered" when born; ? vertex presentation.*

Liver enlarged, cgd. *L. kidney* cgd., especially at bases of pyramids; *R. kidney* has hge. into hilum, and a few drops of blood are effused into the cellular tissue behind the organ. *Dartoid tissue* œdematous. *Meninges* of brain cgd. at upper part of fissure of Rolando.

CASE 22.—M., 6 lbs. 6½ oz. (without cranium and brain), 21½ in.—*Cephalotripsy.*

Marks of forceps blades on each side of cheeks; several marks also over right brow. All organs pale, no hge.

CASE 23.—*Forceps; child lived seventeen days; was admitted into hospital for suppression of urine.*

Hge. into substance of *R. frontal lobe* of brain immediately under bruise produced by the forceps on the skin; the frontal bone at this part is very thin and depressible. Much hge. into *pyramids of kidneys* (Pl. III, fig. 3, and Pl. IV, fig. 1).

CASE 24.—F., 4 lbs. 6 oz., 19 in.—*Lived four days; jaundice.*

The *spleen* is a little blacker than in the normal stillborn.

CASE 25.—M., 2 lbs. 13 oz.—*Accidental hæmorrhage; fourth breech presentation; membranes ruptured (before the cervix was fully dilated); shortly afterwards the child was born with one strong pain.*

Scrotum swollen and dark red; œdema of dartoid; coagulated jelly-like material in each tunica vaginalis. *Testicles* black from hge. into their substance. Hge. also

into both *spermatic cords*. *Lungs* dark purplish red. *Kidneys* much cgd.; small hge. into connective tissue of hilum. *Spleen* cgd. *Brain*, hge. (slight) on surface of temporo-sphenoidal lobes; hge. at base of brain, around medulla, pons, and cerebellum. Medulla and choroid plexuses cgd. Black clot in *longitudinal and lateral sinus*. Slight hge. under *pericranium*.

CASE 26.—M., 3 lbs. 10½ oz.

Hands and arms very blue; hge. into *muscles of arms*, none into cellular tissue. *Peritoneum* contains blood (from the liver). *Liver* has a hge. on upper surface of the size of a halfpenny; the capsule is ruptured. *Supra-renals* cgd., and slight hge. into medulla; no rupture. *Caput succedaneum* over posterior part of R. parietal bone. Slight hge. at base of brain (skull-bones very flexible). Hge. into each *processus vaginalis*. *Spermatic veins* slightly cgd. *Testicles* cgd.

CASE 27.—F., 9 lbs. 5½ oz. (without brain).—*Cephalotripsy and embryotomy; a large child and contracted pelvis, with conjugata vera of three inches*.

L. lung bruised at upper lobe (crotchet). *R. lung* shows subpleural hge. at lower edge. *Liver* (12½ oz.) is bruised at upper surface, and there is a subcapsular hge., apparently produced by the crotchet.

CASE 28.—M., 5 lbs. 10½ oz.—*Primipara, aged 35; slightly contracted pelvis; in labour twenty-four hours; low forceps; delivery took fifteen minutes; child lived one hour*.

Lips and mucous membranes blue. *Larynx* cgd. *Liver* much cgd.; on upper surface halfway between anterior and posterior edge, and just to right of suspensory ligament, is a subcapsular hge. of the size of a sixpence. *L. kidney* is much cgd. at bases of pyramids; considerable hge. into cellular tissue of hilum, which shows externally. *R. kidney* is cgd.; no hge. *Edema of scrotum*. *Sper-*

matic veins full. *Caput succedaneum* over lower half of R. parietal bone. *Brain*, a small amount of hge. over surface of hemispheres, and one or two drachms over base of L. temporo-sphenoidal lobe and over pons and medulla; the skull-bones are very thin.

CASE 29.—M., 5 lbs. 12 oz., 20 in.—*Natural vertex delivery; delay with body (circumference at lower epigastrium 13 in.).*

The *liver* is very large ($8\frac{1}{2}$ oz.), reaches down to iliac crest, and is cgd. On the upper surface of the L. lobe, just to the left of the point of entry of the umbilical vein, is a subcapsular hge., measuring an inch and a quarter across and a quarter of an inch in thickness. There is a smaller hge. to the right of the umbilical vein in the canal for the passage of the vein. There is a *bruise round the child's body* just below the ensiform cartilage; it is evidently due to compression of this part by the cervix, owing to the large liver. Hge. into cellular tissue of *scalp* over R. parietal bone and under pericranium. Cerebral *meninges* cgd. Thin edges of lower lobes of both *lungs* are bruised black (by cervix), and there is hge. into pulmonary tissue as well as beneath the pleura. *Kidneys and supra-renals* cgd. *Edema of scrotum.*

CASE 30.—F., 3 lbs. $3\frac{1}{2}$ oz., 16 in.—*A twin (with Case 31); icterus; a natural vertex presentation; child lived four days.*

Legs and back of feet are hard and œdematous, no hge. Much yellow œdema (and some hge.) over upper and posterior part of R. parietal bone. The body of the child is generally pale.

CASE 31.—F., 3 lbs. $4\frac{1}{4}$ oz., 16 in.—*Natural breech presentation; lived four days.*

Hge. from *nose*. *Edema* of body generally and marked blueness (child was markedly cyanosed and cold during life). *Hands, legs, and feet* very blue and œdematous.

Nails blue-black; *eyelids* swollen, eyes healthy. *L. lung* solid, of slate-blue colour, of the consistence of liver, black-red on section, and evidently has much hge. into its substance; there are only *two* air-cells developed, and no petechiæ. The *R. lung* is a little larger than the *L.*; it is of a deep slate colour, but has a few more air-cells developed than on the other side. *Peritoneum* contains a little yellow fluid. *Pulmonary valves* redder than aortic. *Liver* has a hge. measuring one inch across and one-third of an inch thick on the upper surface of *R. lobe* beneath the capsule; there is a smaller hge. on both the upper and under surface of *L. lobe*. *R. kidney* cgd.; *L. ureter* is dilated to size of a cedar pencil; a little hge. behind each kidney. *Stomach* contains blood (? from lungs); in its mucous membrane are a few red spots looking like ulcers, of the size of No. 8 shot.

CASE 32.—F., 1 lb. 7 oz., 12½ in.—*A twin (with Case 33); natural vertex delivery.*

A little hge. in connective tissue of *scalp*, and some œdema of *meninges of brain*. *Lungs* and *trachea* cgd. *Liver* cgd. *Kidneys* cgd. at bases of pyramids, which are very pale. A little hge. into cellular tissue of hilum. *Supra-renals* cgd. Vessels at back of *uterus* much cgd., and there is slight hge. there. Vessels in front of *uterus* cgd. *Spinal canal* shows hge. outside theca, especially at nerve foramina.

CASE 33.—F., 1 lb. 12 oz., 13½ in. *Natural vertex delivery.*

Liver cgd. *Uterine veins* cgd. Hge. in pelvis of *kidneys*; cgn. at bases of pyramids. Hge. between *dura mater* and *arachnoid of spinal cord*; cord itself cgd.

CASE 34.—M., 4 lbs. 2½ oz., 17 in.—*Contracted pelvis (conjugata vera 3 in.) ; induction of labour ; forceps ; child lived two days.*

Intestines cgd. *Bases of lungs* solid. *Liver* cgd.; hge.

of the size of a split pea on the upper surface of L. lobe near the falciform ligament. *Supra-renals* cgd.; walls of L. separated by blood. Cgn. of *mediastinum testis*. Hge. and œdema in connective tissue of scalp at vertex. Considerable amount of hge. on surface of R. *cerebrum*; much at base on both sides. Hge. outside theca of *spinal cord* in dorsal and lumbar regions. Fracture of orbital plate of R. frontal bone (by forceps); a small hge. between dura mater and bone at this spot. [Diameters of child's head: Occipito-mental $4\frac{3}{4}$ in., occip.-frontal $4\frac{1}{4}$, suboccip.-bregmatic $3\frac{3}{4}$, cervico-bregmatic $3\frac{3}{4}$, biparietal $3\frac{3}{8}$, bitemporal $2\frac{5}{8}$, bimastoid $2\frac{5}{8}$. Diameters of mother's pelvis: Sp. il. $9\frac{3}{4}$, cr. il. 10, cong. ext. 6, cong. diag. $3\frac{1}{2}$, cong. vera 3 (by hand in pelvis).]

CASE 35.—M., 6 lbs., $18\frac{1}{2}$ in.—*Child had imperforate anus and dilated descending colon; the girth of the abdomen was $14\frac{1}{2}$ in.; a natural vertex delivery; the cord was wound round the child's neck.*

Edema of *dartoid tissue*. *Spermatic veins* much distended, especially on L. side. *Mediastinum testis* much cgd.; also great congestion of surface of testis. *Kidneys* cgd., especially L. Hge. into hilum of both; great congestion of bases of pyramids. *Supra-renals*, hge. into L., great cgn. of R.; no rupture. *Brain* cgd.; intense cgn. of substance of *medulla*. The *nails* are black, the face and *mucous membranes* blue (asphyxia). The *pancreas* is cgd.

CASE 36.—M., 7 lbs., 21 in.—*Natural vertex delivery, born before the arrival of the student; two coils of the funis round its neck.*

Liver has a large subcapsular hge. on upper surface of L. lobe. *Testes* slightly congested. Hge. at base of *brain*; brain cgd. Vessels outside *spinal theca* cgd.; no hæmorrhage.

CASE 37.—M., 5 lbs. $13\frac{1}{2}$ oz., $20\frac{1}{2}$ in. *Multipara; natural vertex presentation; born before the arrival of the*

attendant ; the mother was syphilitic ; the child died on the eighth day from tetanus and septicæmia starting from the umbilicus.

The *peritoneum* is injected. Pus in umbilical arteries and umbilicus very fœtid. *Lungs* cgd. ; subpleural hge. *Liver* cgd. *Supra-renals* much cgd. Great cgn. of *mediastinum testis*. Cgn. of *brain* ; no hge.

CASE 38.—F., 7 lbs. 13½ oz., 22 in.—*Contracted pelvis ; footling presentation ; depression of R. parietal bone ; some traction used to deliver ; occiput rotated backwards.*

Skin dusky blue ; *conjunctiva* cgd. *Nails* blue-black. *Liver* large (8½ oz.), no hge. The body of the *uterus* is much cgd., and there is hge. into its mucous membrane for a depth of about $\frac{1}{3}\frac{1}{2}$ of an inch. The subperitoneal vessels of the *uterus* are also cgd. Both *kidneys* are cgd., the L. especially so ; hge. into hilum of both, especially L. Hge. into medulla of both *supra-renals* ; in the L. it exists as isolated patches (Pl. V, fig. 2) ; the R. organ is converted into a cyst-like capsule filled with fluid blood. Small patches of hge. in the substance of *L. lung*. *Peritoneum* contains yellow, slightly blood-stained fluid (about 3j). There is hge. into the *scalp* at L. temporal region ; the skin of scalp is bruised over the depressed portion of the R. parietal bone ; at this part also there is hge. between *dura mater* and the bone. There is also in this situation hge. on the surface of the *brain*, but no hæmorrhage on the other side. There is hæmorrhage at the base of the brain around the pons and medulla. *Spinal canal* shows hge. outside the theca, also in arachnoid ; hge. or at least intense cgn. of the *anterior cornua* in lumbar region. Hge. beneath the *pia mater* in front of lumbar cord, and dipping into anterior fissure.

CASE 39.—M., 4 lbs. 14 oz., 19 in.—*Natural vertex, born before the arrival of attendant.*

Hge. behind both *kidneys*. Hge. between *supra-renals* and *kidneys*. Great hge. into cellular tissue of hilum of

kidneys ; cortex slightly cgd.; pyramids hardly at all cgd. Much hge. into *supra-renals*. *Scrotum* red and œdematous. *R. spermatic cord* much cgd., L. not. *Mediastinum testis* cgd. *Lungs* much cgd., especially lower lobes ; petechiæ on surface of lungs ; one drachm of yellow fluid in each *pleura*. *Skull* very mouldable owing to wide sutures ; hge. under *pericranium* of posterior part of parietal bones. Hge. on surface of *temporo-sphenoidal lobes*, and at their base. Vessels outside theca of *spinal cord* cgd. ; no hge. outside or into substance of cord.

CASE 40.—F., 6 lbs. 6 oz., 18½ in.—*A rapid delivery ; the nurse said it cried a little, and she “ took a skin off its face.”*

Blue *lips* ; bluish mammary areola. *Liver* (7 oz.) cgd. Vessels on surface of *uterus* a little full. Disseminated hges. in cellular tissue of *scalp*. Œdema of left side of *cortex cerebri*. Œdema fluid at *base of brain*.

CASE 41.—F., 4 lbs., 16 in.—*Anencephalus ; face presentation*.

Two red tubercles of the size of a pea represent lobes of *brain* ; there is hge. into these. *Kidneys* slightly cgd. in cortex only. Both *lungs* greatly congested at bases and lower lobes ; in places they are almost black and solid : it appears as if the lungs had been greatly squeezed (? owing to the slight dilatation of the parturient canal by the small head). *Trachea* cgd. Vessels of *spinal cord* cgd.

CASE 42.—M., 6 lbs. 8 oz., 21 in.—*Multipara ; natural vertex delivery ; cord tightly round neck and pulseless*.

Conjunctiva purplish. *Liver* slightly cgd. *Kidneys* slightly congested. Œdema and hge. into *scalp*. On L. side the lower anterior corner of the parietal bone is much depressed, and has caused, by pressure on the great anastomotic cerebral vein, hge. from its contributory vessels. Some fulness of *spinal veins*.

CASE 43.—F., 3 lbs. 14 oz., 17½ in.—*Child died six hours after birth.*

Kidneys slightly cgd. *Skull* flattened (from depression of L. parietal bone under occipital), sutures lax; considerable amount of blood effused at the upper part of both *hemispheres*.

CASE 44.—F., 7 lbs. 12 oz., 20½ in.—*Multipara; breech presentation; born as far as the head before arrival of student; cord pressed upon, pulseless.*

Hge. from *nose* (due to great cgn. of mucous membrane of turbinate bones, especially on L. side). *Peritoneum* contains some blood-stained serum. There is a bruise over L. side of forehead. *Liver* cgd.; cgn. of cellular tissue of hilum of *kidney*. There is much hge. on both sides of surface of *brain* and at the *base* (squamous suture very depressible); great cgn., if not hge., in *medulla*. Hge. outside theca of *spinal cord*; great cgn. of *anterior cornua*.

CASE 45.—M., 7 lbs. 12 oz., 21 in.—*Breech and footling presentation; the other leg was drawn down and some traction made; a good deal of traction was used to deliver head.*

Blue all over, especially legs; œdema of ankles. *Kidneys* slightly cgd. *Spermatic cord* cgd. (? hge.) *Testes* much cgd., R. almost black. Very extensive hge. over R. *parietal lobe* and at base; blood in fourth ventricle; the hge. at *base of brain* extends into upper spinal canal; clotted blood outside theca of *spinal cord*; veins on surface of cord cgd., and a little blood has escaped from them.

CASE 46.—F., 14½ in.—*Placenta prævia; sixth months child; version, extraction; craniotomy; rigid cervix.*

R. leg bruised, and hge. into its cellular tissue. *Liver* slightly cgd. at upper surface of R. lobe; subcapsular hge. of size of a bean on under surface of R. lobe. *Kidneys*

much cgd. both in apices (several black-red) and around bases of pyramids.

CASE 47.—F., 4 lbs. 4 oz., 19 in.—*Placenta prævia* ; version followed by natural delivery, only slight traction being used to check hge.

L. leg bluish and hard ; slight hge. into its cellular tissue, also into *erector spinæ*, none into sterno-mastoid muscle. *Peritoneum* contains a little yellowish serum. Almost the whole of upper surface of R. lobe of *liver* is covered with a black hge., raising up the capsule (traction was made by right leg, the left being extended). *Kidneys* much cgd., especially the bases of pyramids ; the cgn. extends some distance towards apices of pyramids ; slight hge. into cellular tissue of hilum. *Supra-renals* cgd. *L. pleura* contains a little reddish fluid ; both lungs cgd. at bases, the L. much more than R. ; hge. into thin edge of base of *L. lung* ; some Tardieu's spots. [Microscope shows thick layer of blood raising up pleura from thin edge of L. lung, and blood in alveoli and bronchioles, Pl. VII.] A little blood in *scalp*, no œdema. Great œdema of *brain* and *meninges* ; no hge.

CASE 48.—M., 4 lbs. 13 oz., 19½ in.—*Footling* ; natural delivery ; cord pulseless on arrival of attendant.

Parietal bones depressible below squamous part of temporal. Disseminated hges. in cellular tissue of *scalp*, little œdema. Hge. on surface of *hemispheres* (? caused by moveable parietal bones) and at base ; blood in *R. lateral ventricle*, not in L. ; no hge. in brain substance. *Scrotum* œdematous, bluish ; *testes* much cgd., slight hge. ; *spermatic veins* much cgd., and they pass up to a large hge. at the inner side of the hilum of each *kidney*. Extensive but thin hge. on upper surface of R. lobe of *liver*, beneath capsule ; *supra-renals* much cgd. *Intestines* greatly cgd. Slight excess of yellow fluid in *pericardium*. Cgd. thin edge of lower lobe of each *lung*, especially L., which was black from hge. into its tissues. Hge. into arachnoid

of *spinal cord*. Hge. into right *sterno-mastoid* at its lower part. A good deal of hge. into muscles of lumbar region of back (? produced by cervix uteri gripping the child's body, both legs being down); also in *psoas*, and in muscles around the hip-joint.

CASE 49.—M., 6 lbs. 10 oz., 20 in.—*Placenta prævia*; *version*; *embryotomy* for severe hge. in mother.

The *liver* has a hge. on its upper surface beneath the capsule, probably produced by the finger introduced into the abdominal cavity. *Kidneys* and *testes* cgd. *Lungs* have cgd. edges. *Supra-renals* are full of blood.

CASE 50.—M., 2 lbs., 16 in. [Autopsy not complete.] Hge. outside theca of *cord*. A small amount of hge. in *lateral ventricles*.

CASE 51.—M., 8 lbs., 20½ in.—*Impacted breech*; *child* *breathed a few times*.

Blue bruises in each groin. *Scrotum* red and œdematous. *R. spermatic cord* œdematous. *Glans penis* cgd. Hge. into both *testes*, chiefly into R. A very little blood-stained serum in *peritoneum*. At the apex of *R. lung* is a dark portion of the size of the tip of finger, of the consistence of liver; there is here hge. extending into lung-tissue. *Liver* much cgd. Bases of pyramids and cellular tissue of hilum of *kidneys* much cgd.; no hge. *Supra-renals* very large (1¼ in. × 1¼ in. × ⅝ in.), cgd. No "caput." Posterior parietal bones are beneath occipital bone. *Meninges* cgd., especially beneath the posterior fontanelle.

CASE 52.—M., 7 lbs. (without brain), 21 in.—*Cephalotripsy*; *head* *hard and well ossified*.

Liver cgd.; a little bruising of upper surface. *Pyramids* of *kidneys* cgd. *Supra-renals* large; the L. has its lower half distended with blood. Hge. into *spinal arachnoid*, most marked at lower end.

CASE 53.—*A small fœtus (fifth month). It had bled to death in utero from a hole in a branch of the umbilical artery ; the blood (about 3ij) had collected between the chorion and amnion on the fœtal surface of the placenta.*

All organs bloodless.

CASE 54.—M., 7½ lbs., 20 in.—*Contracted pelvis ; prolapsed cord ; version ; considerable traction and suprapubic pressure.*

Child pale ; slight bruising of skin above clavicles. Posterior part of upper surface of R. lobe of *liver* cgd. Scalp a little œdematous at vertex ; hge. over apex of occipital bone one-eighth of an inch thick, also beneath the pericranium. Hge. all over surface of *brain* and around base ; two minute hges. in floor of *fourth ventricle* ; two red patches in *anterior cornua of upper spinal cord*. Hge. outside theca in lumbar region ; much hge. under laminæ of upper cervical vertebræ ; slight hge. in spinal arachnoid.

CASE 55.—M., 6 lbs., 20 in.—*Umbilical hepatic hernia ; imperforate anus.*

Liver cgd., especially hernial portion.

CASE 56.—F., 5 lbs. 14 oz., 21 in.—*Breech with extended legs ; twelve hours in labour ; extraction.*

Labia majora and *minora* much bruised (blackish red). Hge. into cellular tissue outside *vagina*. *Cervix uteri* cgd. Mucous membrane of *body of uterus* very red ; hge. into the subperitoneal tissue at the back of uterus. *Liver* cgd. Slight hge. into hilum and at bases of pyramids of *kidneys*. *Peritoneum* contains blood. Hge. into pericæsophageal connective tissue. *Stomach* slightly cgd. at cardiac end ; well-marked cgn. at *pylorus* ; great cgn. of *duodenum*. Scarcely any œdema of scalp. Diffuse hge., moderate in amount, over both parietal regions of *brain* ; a patch of blood of the size of sixpence over left temporo-sphenoidal region ; hge. at base of brain. Hge. in cellular tissue

outside theca ; *spinal veins* much cgd., especially posteriorly ; *anterior cornua* cgd.

CASE 57.—M., 6 lbs. 11 oz., 20 in.

Blood effused under nails. *Trachea* and *lungs* cgd. *Parietal pericardium* stained in patches with dark blood ; visceral pericardium has patches of dark blood beneath it on the R. side of R. ventricle, in front over the interventricular septum, and on the surface of the pulmonary artery and aorta. The *mitral* and *tricuspid valves* are thickened with lymph, and there is hge. into this. Bases of pyramids of *kidneys* are much cgd. Fundus of *stomach* cgd.

CASE 58.—M., 2 lbs., 15 in.—*Primipara* ; *breech presentation* ; *membranes prematurely ruptured* ; *R. leg came through the os and was firmly grasped by the cervix* ; *considerable traction employed to deliver*.

Larynx, *liver*, *stomach*, and *penis* cgd. The *lungs* are of a uniform pale Indian-red colour except at the apices of both lungs and at the base and edge of L. lung, where they are black ; at these places there is hge. into lung substance. Congestion at bases of pyramids of both *kidneys* ; about a drachm of dark fluid blood surrounds the L. kidney ; the blood apparently comes from a ruptured small vein. The *R. testicle*, which is in the abdomen, has blood adhering to its lower end, and there is a large hæmatocele of the cord extending from the testicle to the bottom of the scrotum on that side (see Woodcut, p. 281). The *R. leg* and foot have hge. into the cellular tissue to a depth of one-eighth of an inch. *Scalp* slightly cgd. in places. Hge. into lambdoid suture.

CASE 59.—M., 7 lbs., 18½ in.

Cgn. of *oesophagus*, *testes*, and *intestines*. *Stomach* : mucous membrane dotted with red points. *Peritoneum* contains a little yellow fluid. Spots of hge. in pericranium and sutures. Hydrocele of *tunicæ vaginales*.

CASE 60.—M., $8\frac{3}{4}$ lbs., 21 in.—*Secundipara*, aged 34; last child seven years ago; flat pelvis ($3\frac{1}{2}$ in. true conjugate); slight hydrocephalus; circumference of head above orbits $15\frac{3}{4}$ in.; occipito-mental diameter $6\frac{1}{8}$ in.; occipito-frontal $5\frac{1}{8}$ in.; biparietal $4\frac{1}{2}$ in.; forceps (two applications); version, strong traction; child just alive when born.

Edema of scrotum; testes cgd. Three forceps marks on scalp; deep bruising of skin over R. frontal bone; abrasion behind R. ear. A few hges. in *thymus*. *R. pleura* contains a drachm and a half of blood-stained fluid. *Lungs* generally cgd.; down the posterior surface of R. is a line of hge. $\frac{1}{4}$ in. wide; there is also hge. at under surface of R.; hge. into apices of both lungs. *Spleen* cgd.; $\bar{3}j$ of fluid in *tunicæ vaginales*. *R. supra-renal* is covered for a space of $1\frac{1}{2}$ in. $\times$ $1\frac{1}{8}$ in. by a layer of black blood which has escaped through a laceration in the capsule and its peritoneal investment. In the *scalp*, over both parietal bones, and over R. frontal bone is a thick layer of blood; hge. into R. temporal muscle. R. frontal bone is fractured immediately under the bruise in the skin (forceps), and the *dura mater* is congested beneath the fracture. There is also a fracture of the roof of the R. orbit, and the *dura mater* is filled up from the bone by $\bar{3}j$ of blood. There is hge. into *R. Sylvian fissure* and over both temporo-sphenoidal lobes. *Tentoria and falx* black with extravasated blood. About $\bar{3}ij$ of blood-stained fluid in the *ventricles*. *Cerebellum* and *medulla* cgd. A drachm and a half of blood has escaped from the ruptured supra-renal into the abdomen.

CASE 61.—M., 5 lbs., $18\frac{1}{2}$ in.—*Natural vertex presentation*; child died convulsed three hours after birth.

Head and face cgd.; nails black. *Liver* much cgd.; three small hges. on upper surface. *Spleen* much cgd.; hge. into it in places. *Kidneys* cgd. *Supra-renals* distended with fluid blood. Slight superficial hges. on surface of pulmonary artery. Slight hge. beneath pericranium of parietal bones (upper parietal bones very thin).

CASE 62.—F., 3 lbs. $8\frac{1}{2}$ oz., $16\frac{1}{2}$ in.—*Case of foetal rickets.*

No hges. ; organs pale.

CASE 63.— $14\frac{1}{2}$ oz., $10\frac{1}{2}$ in.—(?) *Breech ; traction.*

R. leg has blood effused into muscular planes ; hge. into superficial and deep *muscles of left side of neck* ; slight hge. into prævertebral (cervical) tissues. *Peritoneum* contains a small amount of bloody serum. *Liver* cgd. ; a small subcapsular hge. on upper surface. Small subcapsular hge. at upper part of *L. kidney*. *L. supra-renal* cgd. *Spleen* cgd. *L. pleura* contains 3j of bloody serum ; *R.* contains a few drops. *L. lung* much cgd., almost black, at base of lower lobe ; this lobe is greatly cgd. throughout, contrasting very strongly with the salmon-coloured upper lobe. *R. lung* cgd. Large *caput succedaneum* over both parietal bones. Hge. in both *Sylvian fissures* of brain.

CASE 64.—F., 5 lbs. $6\frac{1}{2}$ oz., 19 in.—*Vertex presentation ; slight accidental hæmorrhage ; os of size of half-a-crown, soft ; bleeding recurring after three hours, the membranes were ruptured, and natural delivery occurred two hours later.*

Hge. from *nostrils*. *Liver* and *spleen* cgd. *Petechiæ* all over *lungs*, which are cgd. Hge. beneath pericranium of both parietal bones.

CASE 65.—F., 6 lbs. $13\frac{1}{2}$ oz., $20\frac{1}{2}$ in.—*Born alive ; gave one or two gasps and died.*

One drachm of straw-coloured fluid in *R. pleura*, less in *L.* *L. kidney* is intensely cgd. (almost black) at lower end ; the cgn. extends into the cortex ; no hge. (*R. kidney* normal). *Duodenum* and *pancreas* cgd. Black clotted blood under the parietal, occipital, and frontal pericranium. *Uterus* intensely red at upper part.

CASE 66.—M., 6 lbs. 2 oz., $17\frac{1}{2}$ in.—*The child was born*

alive, gave a few gasps, and died. It had greatly distended ureters and hydronephrosis.

The abdomen measures $14\frac{3}{4}$ in. in girth, and contains $3\frac{1}{2}$ oz. of yellow slightly blood-stained fluid. Œdema of all the *subperitoneal cellular tissue*. Hge. beneath *peritoneum* over R. kidney in patches of the size of a bean. Œdema of scrotum. *Spermatic veins* on R. side much distended. *Pericardium* contains a little slightly blood-stained fluid. *Brain* intensely cgd. throughout; clot in choroid plexuses. *Cerebellum* intensely cgd., almost black on surface.

CASE 67.—M., 4 lbs. $10\frac{1}{2}$ oz., $18\frac{1}{2}$ in.—*Multipara four hours in labour; vertex presentation; child born before the arrival of attendant.*

Nails black. *Liver* generally cgd. (almost black); two subcapsular hges. on surface of quadrate lobe. *Kidneys* cgd. at bases of pyramids. *Brain* much cgd.; no hge.

CASE 68.—M., 6 lbs. $11\frac{1}{2}$ oz., 20 in.—*Prolapse of funis.*

Liver large, cgd. (blackish red). *Pericardium* contains excess of fluid. *Kidneys, supra-renals, meninges* of brain cgd.

CASE 69.—M., 5 lbs. 11 oz., $18\frac{1}{2}$ in.—*Hemicephalous fœtus with cystic kidneys; prolapse of funis; the heart beat for half an hour after birth; footling; traction.*

Stomach contains half a drachm of blood (? from lungs); the mucous membrane is not cgd. *Duodenum* cgd. *Mediastinum testis* cgd. *Pleuræ* contain $\mathfrak{z}$ j of blood; hge. into *L. lung* (weight $\mathfrak{z}$ $1\frac{1}{4}$) and lower lobe of *R. lung* (weight $\mathfrak{z}$ $1\frac{1}{2}$). *Liver* cgd. *Spleen* much cgd. *Supra-renals* very small, ill-developed, a little cgd., not ruptured. *Brain* very small and ill-developed; hge. at base and on surface; hge. into lobes of *cerebellum* (which project externally for an inch and a half through the posterior fontanelle) and into *medulla*. Œdema and some hge. outside theca of *spinal cord*; hge. all over surface of cord.

CASE 70.—F., 6 lbs. 7 oz., 20 in.—*Lived four days ; icterus.*

Kidneys and supra-renals cgd. A considerable quantity of yellow fluid escapes on opening *skull*. There is a large clot at the *base of the brain* and over the *temporo-sphenoidal lobe* of the R. side, and also over the *Sylvian fissure* ; R. hemisphere considerably larger than L.

CASE 71.—F., 6 lbs. 1 oz., 18½ in.—*Mother had epileptic fits for two days before delivery ; version followed by natural delivery fourteen hours later through a rather rigid cervix.*

Brain has several drachms of blood effused over its L. hemisphere. *R. hemisphere* much cgd. Hge. at *base of brain* and over *L. side of cerebellum*. *Supra-renals* much cgd. ; slight hge.

CASE 72.—F., 3 lbs. ½ oz., 17 in.—*Placenta prævia ; cervix widely dilated, soft ; version ; extraction half an hour later.*

R. leg bruised. Hge. into cellular tissue of *R. side of chest* and of *R. arm*. *Œdema of cerebral meninges* ; considerable hge. on surface of *L. hemisphere*. *R. clavicle* broken.

CASE 73.—M., 3 lbs. 12 oz., 17½ in.—*First vertex presentation ; child lived eight days.*

No cgn. ; no hge.

CASE 74.—M., 6 lbs. 12½ oz., 27 in.—(?) *Breech presentation ; child died, suffocated with membranes over its head.*

Marked blueness of L. side of face, of mucous membranes, and of nails. Cgn. of *conjunctiva*. *Scrotum* *œdematous* ; *spermatic cord* cgd. Cgn. of *liver*, bases of *pyramids of kidneys*, *supra-renals*, *larynx*, *trachea*. No *œdema of scalp* ; small hge. of size of sixpence in connective tissue over R. parietal bone. Great cgn. of *brain*.

CASE 75.—M., 2 lbs. 4 oz.—*Twin (with Case 76), lived fourteen days.*

L. testis cgd. *L. spermatic cord* bigger than R.

CASE 76.—M., 2 lbs. 4 oz.—*Twin (with Case 75), lived a few minutes.*

Extensive hge. all over surface of *cerebral hemispheres*.

CASE 77.—F. (seven months child).—*Vertex presentation.*

L. supra-renal much cgd., walls slightly separated. *Kidneys* cgd. at bases of pyramids.

CASE 78.—F., 5 lbs., 19 in.—*Multipara, aged 19 ; twelve hours in labour. Child died eighteen hours after birth, of (?) septicæmia contracted in utero ; vertex.*

Skin bluish, especially of face and front of abdomen. Nails blue-black. Bloody fluid in considerable quantity in *pericardium, peritoneum, pleuræ, and arachnoid*. Lower lobe of *L. lung* cgd. Much hge. into *hilum of kidneys*. *Supra-renals* full of bloody fluid. Hge. into cellular tissue around *uterus* and *ovaries*. Hge. into all the *sub-peritoneal cellular tissue*.

CASE 79.—M., 6 lbs. 3 oz., 20 in.—*Contracted pelvis (true conjugate $3\frac{3}{16}$ in.) ; forceps.*

Skull compressible (occipito-mental diameter $5\frac{1}{2}$ in., occipito-frontal $4\frac{3}{4}$ in., suboccipito-bregmatic 4 in., biparietal can be compressed to $2\frac{7}{8}$ in.). There is a blister on L. cheek (forceps), forceps-mark also on R. cheek ; brush-burn over L. frontal eminence ; hge. into scalp over L. parietal bone and around and over the posterior fontanelle ; subpericranial hge. over foreparts of both parietal bones and the hinder parts of both frontal bones. A small effusion of blood at the *base of the cerebellum* and *around the medulla*. Hge. from nose. Œdema of *scrotum*. Petechiæ over *lungs*. Hge. in front of *supra-renals* ;

also into substance of organ and in cellular tissue between supra-renal and kidney. Cortex of *kidney* cgd.

CASE 80.—F., 6 lbs. 8 oz., 20 in.

Lungs, petechiæ and cgn. *Kidneys*, hge. into hilum and at base of pyramids. Hge. into *gluteus maximus*. Hge. on surface of *R. hemisphere* and beneath the pericranium.

CASE 81.—M., 6 lbs. 12 oz., 20 in.—*Spina bifida*; *hydrocephalus*; *child born before the arrival of attendant*.

Skull incompletely ossified. Blood effused all over surface of *R. hemisphere*; 3ij of yellow fluid in *lateral ventricles*. *Nails* blue-black. *Scrotum* red and œdematous. *Testes* almost black, can be pulped between the fingers, L. blacker than R.

CASE 82.—F., 3 lbs. 4 oz., 16 in.—*Primipara*; *second vertex presentation*.

Abdomen contains a few drachms of yellow fluid; œdema of wall. *Pleuræ* and *pericardium* have an excess of fluid. A small subscapular hge. on upper surface of *R. lobe of liver*. Bases of pyramids of *kidneys* cgd. *L. supra-renal* cgd. A few petechiæ on *lungs*. Hge. over both parietal lobes, and a considerable quantity at *base of brain*.

CASE 83.—M., 3 lbs. 1 oz., 16½ in.—*Accidental hge.*; *second breech presentation, legs extended*; *forceps*; *traction by finger in groin*.

Bruise in L. groin (traction). *Peritoneum* contains a small quantity of blood. Blood in each *tunica vaginalis*; œdema of dartoid and some hge.; hge. into *mediastinum testis*; *R. spermatic cord* thicker than L. *Liver* soft; on lower surface are several extensive, quite thin subcapsular hges.; on upper surface of *R. lobe* at the anterior edge is

a hge. of the size of a sixpence. Cortex of *L. kidney* greatly cgd. (R. normal); hge. into *L. supra-renal*, *R. supra-renal* slightly cgd. *Lungs* much cgd. at bases and thin edges; petechiæ. Subpericardial hge. at base of R. ventricle in front, and of L. behind. Scalp œdematous, and much blood is effused into it over lower part of occipital and left parietal bones; blood is effused in a thick layer under the periosteum of parietal, occipital, and frontal bones, especially on the L. side. Hge. on L. side of surface of *brain* and at base. Hge. into meninges of *spinal cord*.

CASE 84.—M., 6 lbs. 11 oz., 20½ in.—*Prolapse of funis*; *forceps*.

Dusky mucous membranes and skin. *Nails* blue-black. Mark of forceps over L. parietal bone (skull very thin in lower parietal regions). Hge. in quantity over surface of *L. hemisphere* and at base, some also in R. side; hge. on upper surface of *cerebellum*. Hge. between spinal dura mater and cord; (?) hge. into *anterior cornua* of cervical enlargement. *Liver* cgd. Apices of pyramids at upper part of *R. kidney* black-red; whole of pyramids of *L. kidney* cgd. *L. supra-renal* cgd. Hge. (shown by microscope) into *mediastinum testis*. Œdema and redness of *scrotum*.

CASE 85.—F., 1 lb. 11½ oz., 15½ in.—*Multipara*; *rigid cervix*; *accidental hæmorrhage*; *footling presentation*; *strong traction*.

Legs black. Black bruise on L. shoulder and on back. Hge. into *L. sterno-mastoid*, *temporal muscle*, *gluteus maximus*, *erector spinæ*, cellular tissue and muscles of legs, and cellular tissue of R. thigh. Œdema and hge. in scalp. Black subpleural and intra-pulmonary hge. at posterior border of *R. lung* and at thin edge of bases of both lungs, especially R.; 3j of fluid in each *pleura*. *Liver* large, subcapsular hge. on upper surface of R. lobe; it has burst through the capsule into the peritoneum. Hge. into *great omentum*. Hge. into hilum of both *kidneys*. Hge. into

R. supra-renal. Much hge. on surface of *l. cerebral hemisphere* and at base of brain on both sides. *Spinal cord* cgd. ; hge. between dura and arachnoid.

CASE 86.—F., 6 lbs. 10½ oz., 20 in. *Natural vertex.*
Face blue. *Liver* much cgd. *Fallopian tubes* cgd.

CASE 87.—M., 7 lbs. 2 oz., 20 in.—*Mother had secondary syphilis three months before this child was born.*

Face dusky. *Abdomen* contains 3ij of bloody fluid. *Liver* cgd. *Kidneys* slightly cgd. *Œdema of scrotum.* Cgn. of *mediastinum testis* and beneath tunica albuginea. Very little hge. or *œdema* of scalp. Clear fluid at base of brain ; *meninges* opaque, cgd. Slight fracture (in direction of bony fibres) at upper part of *L. parietal bone.*

CASE 88.—M., 4 lbs. 10 oz., 17 in.—*Natural vertex ; secundipara.*

Face blue ; some petechiæ. *Abdomen* contains a small amount of fluid. Hge. into *mesentery* all over abdomen. Black petechiæ on *lungs.* Hge. into hilum of both *kidneys.* *Testes* cgd. ; hge. into *R. testis* shown by several black apoplectic spots. *Brain* *œdematous* ; some blood-stained fluid on surface ; excess of fluid in lateral ventricles. (?) Hge. into anterior cornua of lumbar cord. *Liver* cgd.

CASE 89.—F., 5 lbs. 12 oz., 19½ in.—*Labour lasted eight hours ; membranes prematurely ruptured ; breech presentation ; delivery natural till shoulders were born, when the child gasped, and was delivered with difficulty by the mid-wife stillborn.*

Body pale ; *nails* blue-black. Slight cgn. at bases of *pyramids.* Slight hge. into medulla of both *supra-renals* at upper part. Vessels of *uterus* and *Fallopian tubes* cgd. Hge. on surface of *brain* beneath the upper part of *R. parietal bone.* Hge. outside theca of *spinal cord.*

CASE 90.—M., 5 lbs. 2 oz., 19½ in.—*Multipara*, fourteen hours in labour ; first cranial position ; head long on perinæum ; cord twice round neck ; forceps.

Face bluish ; bruise over glabella, also in malar region (forceps). *Conjunctiva* cgd. *Kidneys* and *mediastinum testis* cgd. Head much elongated upwards and backwards ; *caput succedaneum* over R. posterior parietal bones ; a large hge. on R. side of surface of *brain*. Œdema of tissues outside theca of *spinal cord*.

CASE 91.—M., 4 lbs. 8 oz. (eighth month), 18 in.—*Multipara*, aged 39 ; five hours in labour ; breech presentation, arms extended ; extraction of head difficult ; child's heart beat for twenty minutes, but the child never breathed.

Scrotum and *buttocks* blue-black ; hge. into cellular tissue and muscles of buttock and thigh ; hge. into lower third of *R. sterno-mastoid*. Very little œdema of scalp ; small disseminated hges. in cellular tissue just above the periosteum ; R. posterior parietal bone is very thin ("egg-shell crackling"), and the bone can be easily indented by the finger to a great extent ; hge. on the surface of the *brain* at the junction of middle and posterior thirds just outside longitudinal fissure ; a large quantity of blood under the R. parietal bone where it is so soft. Small hge. under capsule of quadrate lobe of *liver*. *Kidneys* cgd. at bases of pyramids. *Supra-renals* cgd., slight hge. into L. Hge. into *testes*, dartoid tissue, and outside theca of *spinal cord*.

CASE 92.—M., 2 lbs. 8 oz., 15¼ in.—*Syphilis* in mother ; breech presentation.

Blue feet, red legs, blue left hand and forearm (bruised). Hge. into muscles of buttock and thigh. Small amount of yellow fluid in *abdomen*. Much œdema of *brain*. *Lungs* and *testes* cgd.

CASE 93.—M., 11 lbs. 4½ oz., 22½ in.—*Multipara* ;

occipito-posterior position; forceps (child alive when forceps applied, but stillborn).

A red bruise half an inch below L. eye. Body of a bluish-grey tint. *Conjunctiva* cgd. Slightly blood-stained yellow fluid in *pericardium*. *Liver* cgd. Cgn. of hilum of *kidneys*. Œdema of *scalp*; hge. in cellular tissue over R. anterior upper part of parietal and still more over upper L. occipital bone. Skull very hard and incompressible. Slight hæmorrhage all over vertex of *brain*, also on *cerebellum*. A little hge. outside theca of *spinal cord* in cervical region. Hydrocele of *tunica vaginalis*. Hge. into *L. testicle*, R. cgd.

CASE 94.—M., 5 lbs. 8 oz. (without brain), 21 in.—*Cephalotripsy (child previously dead); prolapsed funis.*

A little hge. in arachnoid cavity in cervical region.

CASE 95.—M., 1 lb. 8 oz., 15 in.—*Accidental hæmorrhage; vertex presentation.*

Kidneys cgd. Hge. into *R. sterno-mastoid*.

CASE 96.—F., 4 lbs. 9 oz. (without brain), 18 in.—*Kyphotic pelvis; cephalotripsy.*

No cgn.; no hge. in any organ.

CASE 97.—M., 16½ in.—*Tedious natural (vertex) delivery; child weak, died in convulsions a few hours after birth.*

Thrombosis of *longitudinal sinus*; much cgn. and œdema of *meninges* of brain, especially near the longitudinal sinus. There is much serum and clotted blood in the cellular tissue of posterior part of scalp (it seems as if the clotting has spread from this part into the longitudinal sinus).

CASE 98.—M., 8 lbs. 2 oz., 21½ in.—*Contracted pelvis; forceps (difficult delivery).*

There is a bruise 1¼ in. above R. eye (forceps), also on

left side of neck over *sterno-mastoid* (forceps) ; under this latter bruise is a black hge. into the lower three-fourths of the sterno-mastoid muscle (the omohyoid is *pale*). The *L. internal jugular vein* is greatly distended (as thick as the little finger), having been clamped by the point of the forceps blade ; on the R. side the vein is normal. The R. frontal bone is fractured (forceps). Much black blood in scalp. Great effusion of black blood over surface and at base of *brain*.

CASE 99.—M., 6 lbs. 10 oz., 21 in.—*Primipara* ; seven hours in labour ; *vertex presentation* ; the child had a right *diaphragmatic hepatic hernia*, and lived for three quarters of an hour.

The surface of the portion of *liver* within the thorax is covered with petechiæ as big as pins' heads, resembling Tardieu's spots in the lungs.

CASE 100.—F.—*Lived three days ; very blue at birth ; vertex presentation*.

Blue-black *nails*. *Intestines, uterus, Fallopian tubes, and ovaries* cgd. *Lungs* enormously cgd. at bases on both sides. Extensive hge. behind *R. supra-renal*, which is much cgd. Thrombosis of longitudinal sinus ; great cgn. of vessels of *brain ; medulla* cgd.

CASE 101.—M., 1 lb. 9 oz., 14 in.—*Accidental hæmorrhage ; membranes ruptured ; os size of a crown, moderately rigid ; vertex presentation ; child then delivered by one sudden severe pain*.

Scalp much bruised ; black blood effused into it, and also beneath the pericranium. Skull-bones very moveable and depressible, especially the *L. parietal*, under which a small amount of blood has collected in the *Sylvian fissure* ; there is a large quantity of blood in the *L. lateral ventricle*, together with a clot measuring 1 in. by $\frac{1}{2}$ in. Hge. of size of a bean on upper surface to R. of suspensory liga-

ment of *liver*. Hge. into hilum of *kidneys*. *Supra-renals* cgd. Œdema of tissues outside theca.

CASE 102.—M., 5 lbs., 19½ in.—*Natural vertex*; *child revived by artificial respiration, then suddenly died fifteen minutes later*.

Œdema and hge. in *scalp*. A few Tardieu's spots on *lungs*. Hge. on upper surface of R. lobe of *liver*. Hge. under capsule of *spleen* and into its substance (Pl. VIII, figs. 2 and 3). Hge. and cgn. of cellular tissue around *kidneys* and in hilum. Hge. into *supra-renals*. Œdema of *scrotum*. *Testicles* cgd., especially on L. side. Hge. at *base of brain* and into *tentorium cerebelli*, chiefly on L. side.

CASE 103.—M., 7½ lbs. (without skull contents).—*Prolonged labour*; *hydrocephalus*; *brow presentation*; *craniotomy* (child being dead).

Hge. on upper surface of R. lobe of *liver* in front. *Testes* slightly cgd.

CASE 104.—F., 5 lbs. 10 oz., 18 in.—*Anencephalus*; *face presentation*; *child breathed for some minutes after birth*.

Liver much cgd. *Spleen*, *larynx* cgd. Cgn. between *kidneys* and *supra-renals*. *Thyroid* and *submaxillary glands* much cgd. Hge. into periosteum over base of skull. *Medulla* and *cervical cord* black with effused blood; hge. into upper *spinal arachnoid*; hge. into *column of Goll* in lumbar region. Hge. into back of orbits and under the *conjunctiva*.

CASE 105.—M., 3 lbs. 1 oz., 15½ in.—*Twin* (with Case 106), *the first born*; *vertex presentation* (*occiput posterior*); *lived forty-four hours*.

Large hge. in *lateral ventricles*, and on sides of and below both *temporo-sphenoidal lobes*. *Testes* cgd. Hge. into bases of *lungs*, where they are black, solid, and sink in water. *Stomach* contains blood (? from lungs). Hge. into cellular tissue outside theca.

CASE 106.—F., 3 lbs., $16\frac{1}{4}$ in.—*Twin (with Case 105), the last born ; vertex presentation ; lived twenty-eight hours.*

Blue hands, legs, arms. Bruised sternum (artificial respiration). Slight hge. into cellular tissue of *kidneys* and into pyramids. Much hge. on surface of *brain*. *Lungs* slightly cgd. *Thymus* red.

CASE 107.—F., 3 lbs. 5 oz., 18 in.—*Lived four days ; vertex presentation ; forty-eight hours in labour ; membranes ruptured a long time before birth ; no meconium passed ; child vomited meconium ; no obstruction in rectum ; an enema given ; a little meconium passed and a spot of blood.*

Anus bruised (little finger used to explore) ; two drachms of blood in *peritoneum*. Half a drachm in *L. pleura*. *R. pleura* full of black-red blood. *R. lung* solid with effused blood in lower lobe ; *L. lung* black, solid at base. *Kidneys* cgd. *Spleen* black, solid. Hge. into wall of *cæcum* one-third of an inch thick, solid ; the blood has burst into the lumen of the *cæcum*, and has passed into ileum and ascending colon ; it is coagulated, firm, and completely obstructs the gut. There are also two small subperitoneal hges. under the peritoneum of the ileum (Pl. VIII, fig. 4).

CASE 108.—M., 7 lbs. $12\frac{1}{2}$ oz., 22 in.—*Vertex presentation ; cephalotripsy.*

A thin bleb of blood on lower surface of *R. lobe* of liver, also a very small hge. on the upper surface. *Stomach* contains blood and mucus (? the blood comes from the base of the skull). Hge. into cellular tissue outside theca of *spinal cord*.

CASE 109.—M., 4 lbs. 5 oz., 16 in.—*Child had ascites ; vertex presentation ; probably extracted by nurse.*

Tissues beneath lower jaw bruised. Thin edge of base of *lungs* black (? bruised).

CASE 110.—M., 5 lbs. 10 oz., 18 in.—*Placenta prævia*; *vertex presentation*; *forceps employed to hold head in pelvic brim, not to deliver.*

Liver and pyramids and hilum of kidneys cgd. Hge. into *testes*. Lower edges of *lungs* black.

CASE 111.—M., 2 lbs. 12 oz., 14 in.—(*Twin with Case 112.*)

Liver much cgd.

CASE 112.—M., 2 lbs. 8 oz., 14 in.—(*Twin with Case 111.*)

Hge. on surface of both hemispheres of *brain*. Hge. on surface of *liver*.

CASE 113.—F., 6 lbs. 4 oz., 20 in.—*First vertex presentation*; *four and a half hours in labour*; *icterus*; *child had unicorn uterus*; *lived fourteen and a half hours.*

Under surface of *liver* greatly cgd. (? hge.). Yellow oedema and hge. into cellular tissue of legs. Great cgn. of *pectoral muscles*. Several brown-red spots on *lungs*. *Spleen* much cgd.

CASE 114.—F., 6 lbs. 12 oz., 20 in.—*Left diaphragmatic hernia*; *vertex presentation.*

Skull compressible; extensive hge., upper half of *cortex cerebri*. *Liver* very black (? hge.).

CASE 115.—F., 7 lbs. 12 oz., 21 in.—*Labour lasted fifteen hours*; *third breech presentation*; *delay in delivery of shoulders (extension of R. arm).*

Nails blue. Hge. from *nose*. Hge. all over *cortex of brain* and above *cerebellum*. Veins on surface of *spinal cord* much distended. Great cgn. (? hge.) in body of *uterus*, subperitoneal veins at back of *uterus* very full. Hge. into hilum of *kidneys*, which are greatly cgd. Cgn. of *supra-renals* and *spleen*.

CASE 116.—M., 3 lbs. 15 oz., 16½ in.—Autopsy three hours after death. Complete placenta prævia; cervix (rather rigid) dilated by Barnes's bags; difficult bipolar version (membranes previously ruptured); L. leg brought down; slight traction to check hæmorrhage and to deliver head.

Hge. in R. upper sterno-mastoid; much hge. into R. upper splenius capitis; hge. into R. parotid, and into tissues beneath lower jaw; hge. into pericæsoophageal cellular tissues. Hge. into scalp (scarcely any œdema). Hge. and œdema fluid all over surface of brain, especially at base. Spinal cord cgd.; (?) hge. into anterior cornua at various levels. Extensive hge. beneath capsule over nearly whole of upper surface of R. lobe of liver. Spleen cgd. Much hge. into hilum of kidneys. Supra-renals cgd. Apparently hge. into lumen of large intestine in places. Testes slightly cgd. Hge. into glans penis. Blood-stained fluid in pleuræ, especially R. lungs; generally cgd. Thymus much cgd. (? hge.).

CASE 117.—F., 5 lbs. 8 oz., 19 in.—Natural first vertex delivery.

Body pale; slight bruise on R. forehead. Extensive subcapsular hge. on upper surface of both lobes of liver, and on lower surface at the quadrate lobe and other places. Hge. into lungs (almost black). Hge. beneath visceral pericardium in several places. Great cgn. and some hge. in Schneiderian membrane. Very little œdema of scalp; hge. under the periosteum of both parietal bones. Hge. on surface of upper posterior parietal lobes; fulness of veins on upper surface of cerebellum. Mucous membrane of stomach, œsophagus, and jejunum greatly cgd.; hge. into duodenum. Cgn. of vessels on front surface of uterus. Spleen greatly cgd. in blackish spots. Kidneys (especially L.) dark blue on surface; cortex deeply ecchymosed. Supra-renals cgd.; slight hge. into left. Thymus (large) much cgd.

CASE 118.—M., 1 lb. 6½ oz. (without head), 14½ in.—*Labour lasted nineteen hours ; third brow presentation converted into face ; then rapidly born.*

Meningeal hge. on both sides over surface of brain and cerebellum ; *falx* cgd. Small *hge.* on upper surface of *liver*.

CASE 119.—M., 6 lbs., 19¾ in.—*Natural vertex delivery ; child was very blue from birth ; lived three days.*

Intense cgn. of small *intestines* and *omentum*. *Pyramids* of upper half of *R. kidney* cgd. *Thyroid* much cgd. *Lungs* semi-solid, greatly cgd. ; excess of fluid in *pleura*. Thrombosis of *longitudinal sinus* ; the whole of *brain* greatly cgd. ; *hge.* into *tentorium cerebelli* ; *hge.* around *cerebellum* and *medulla*.

CASE 120.—M., 5 lbs. 15 oz., 19 in.—*Face presentation.*

Bruised forehead, cheeks, and lips ; ecchymosed eyelids ; a transverse bruise at crease in front of neck ; conjunctivæ of a deep black-red. “Caput” on *R. side* of head, also all over forehead (chiefly *R. side*) and over occiput. *Hge.* into connective tissue of scalp at *R. upper* and posterior part of parietal bone. *Hge.* between *dura mater* and bone in various places ; *hge.* into *falx*. *Meninges* of brain full on *L. side*, not on *R.* ; copious *hge.* on under surface of *L. temporo-sphenoidal lobe*, none in *R.* ; *hge.* around *medulla* and around and above *cerebellum*. *Lungs* cgd. ; a few subpleural petechiæ. Bases of *pyramids* of *L. kidney* cgd.

CASE 121.—M., 9 lbs. 4 oz., 21 in.—*Forceps ; difficult delivery of shoulders* (6½ in. across).

“Caput” on *R. side* (œdema and disseminated *hges.*) ; great cgn. of frontal suture ; cgn. of *Schneiderian membrane*. Slight *hge.* over surface of *brain* ; much *hge.* at base around *medulla* and *cerebellum* ; *hge.* into *tentorium cerebelli*. Œdema outside *theca*, chiefly at lower part ;

much hge. inside theca, chiefly at lumbar enlargement. (*Esophagus*, *duodenum*, and *testes* cgd. Great cgn. of *larynx* and *liver* (9 oz.).

CASE 122.—M., 5 lbs. 14½ oz., 19 in.—*Placenta prævia*; *bipolar podalic version* (*os* nearly fully dilated); *easy natural delivery* two hours later; *autopsy* eighteen hours after birth.

Body pale. *Meninges* of brain very œdematous, bags of œdema-fluid hanging under the temporo-sphenoidal lobes. Vessels around *medulla* and *cerebellum* cgd. A little hge. outside theca. *Thymus* and *supra-renals* cgd.

CASE 123.—M., 6 lbs. 9½ oz., 20¼ in.—*Breech presentation*, *natural* except that arms became extended.

Hge. over R. upper coronal suture. Vessels of brain full, especially around *medulla* and *cerebellum*. Hge. outside theca. *Liver* cgd. on lower and upper surface in front. Hge. of size of No. 7 shot in the middle of one of the *pulmonary valves*. *Kidneys* much cgd.; hge. into cellular tissue behind R. *Duodenum* cgd. Hge. into *testes*; *spermatic cords* full, especially R.; (?) hge. into lower spermatic cord; *scrotum* œdematous and red.

CASE 124.—M., 5 lbs. 8 oz., 19½ in.—*Imperforate rectum*; *lived one day*; *blue from birth*.

Body dusky; œdema of abdominal walls (? from pressure of distended rectum on pelvic veins). *Kidneys*, *supra-renals*, *liver*, and *duodenum* cgd.; great cgn. of upper part of *oesophagus*. The *heart* has only one cavity, the right side being rudimentary. The veins of the body are full, especially those of neck. Brain vessels much cgd., especially of *Sylvian fissure* (? hge.); much œdema of lower surface of *temporo-sphenoidal lobes*.

CASE 125.—F., 2 lbs. 6 oz., 14½ in.—*Fourth vertex presentation*; *labour* lasted twelve hours; *child* lived twenty-six hours; during life it went through curious antics,

raising its right hand above its head, and its left hand upwards towards its right hand.

There is a considerable hge. over the *R. temporo-sphenoidal lobes* (Pl. III, fig. 1), also a thin layer all over surface of brain (chiefly on R. side) above cerebellum and around medulla. Hge. outside theca. Bases of pyramids of *kidneys* and the *supra-renals* cgd.

CASE 126.—M., 5 lbs., 19 in.—*First breech presentation; legs extended; natural delivery; labour lasted thirteen hours; mother thinks the child died six hours before birth.*

Hge. over posterior fontanelle. Nails blue-black. Body very pale; internal organs generally pale. Hge. outside theca in cervical region. Enormous collection of blood under the capsule on the upper surface of right lobe of *liver* (Pl. III, fig. 4); this hge. was probably produced by the pressure of the extended lower limbs, and seems to have been the cause of death. Slight cgn. of bases of pyramids of *kidneys*. Hge. into *jejunum*. *L. testis* (in the scrotum) has hge. into it; *R. testis* (in the abdomen) shows a cgd. mediastinum only.

CASE 127.—M., 4 lbs. 9 oz., 19½ in.—(?) *Face presentation.*

Hge. under frontal aponeurosis on both sides; hge. over R. upper coronal suture; œdema of forehead and of eyelids. Small amount of blood under the dura mater of both frontal bones, due to cracking of the internal table of the skull. Cgn. of *œsophagus* behind cricoid. *Larynx* and *trachea* cgd., and contain meconium which has passed into the smaller bronchioles. A few Tardieu's spots on *lungs* (cgd.). *Liver* and *thymus* cgd. *Supra-renals* and *kidneys* greatly cgd.; hge. at bases of pyramids and into some of the pyramids. *Spleen* nearly black; much blood effused beneath the capsule on inner and outer surface and into its substance (Pl. VIII, fig. 1). Great cgn. (? hge.) of

both *testes* ; (?) hge. into *spermatic cords*. Great œdema outside *theca* ; vessels on back of *spinal cord* much cgd. *Cerebral meninges* cgd. on L. side. L. parietal bone beneath R.

CASE 128.—F., 6 lbs. 8 oz., 19½ in.—*Breech, extended legs ; impaction ; failed to bring down leg ; traction with fillet in groin ; arms extended, difficult to bring down ; child died during delivery of arms.*

Hæmatoma of L. *labium minus* ; hge. into cellular tissue around orifice of *vagina*. A little hge. at base of *brain* beneath *temporo-sphenoidal lobes*, a little also along the course of the vessels of L. *Sylvian fissure*, which seem to have been pressed upon by the anterior lower corner of parietal bone. Yellowish-brown œdema and a little hge. under *spinal laminae*. *Meconium* in *lungs* (no *petechiæ*). Small hge. into anterior edge of lower sternal portion of L. *sterno-mastoid*. *Thymus* cgd. *Liver* bruised (? by lower limbs). Cgd. bases of *pyramids of kidneys* ; hge. into *hilum*. *Supra-renals* cgd. ; (?) hge. into R. *Spleen* much cgd. Bruising of tissues in front of L. *hip* (where handkerchief pressed) ; cgn. of margin of *acetabulum* and of *Y-shaped ligament*.

CASE 129.—M., 5 lbs. 10 oz., 19 in.—*Easy breech delivery ; child lived six days.*

Lungs : at their lower edges are a few dark-purplish places, more solid than the rest of the lung ; they look as if they had had hge. into them and were recovering from it. *Spleen* cgd. *Edema* outside *theca*.

CASE 130.—F., 8 lbs. 12 oz., 21¼ in.—*Shoulder presentation ; version.*

Edema over point of L. *shoulder*. *Lungs* cgd. ; not solid ; no *petechiæ*. *Spleen* and *supra-renals* cgd. *Liver* cgd. at L. lobe and R. lobe where *diaphragm* is attached. *Kidneys* greatly cgd. ; hge. into *hilum* of L. Hge. all

over *brain*, and at base and above *cerebellum* and around *medulla*. Hge. into *spinal arachnoid*. Hge. over R. upper lambdoid suture. Two little shot-like hges. in the red tuberculated fringed edge of the *mitral* and the *tricuspid valve* on the auricular aspect.

PART II.

TABLE I.—*Injuries to the Brain.*

No. of case.	Congestion.	Hæmorrhage.	Mode of delivery.
3	•	At base	Forceps (prolapsed funis).
4	•	•	•
5	•	•	•
6	•	•	Version.
7	•	•	<i>Conduplicato corpore.</i>
11	•	•	(?) Breech.
	•	•	Forceps (accidental hæmorrhage); (?) dead before.
12	•	Over base, pons, cerebellum, medulla; clot in choroid plexus	Forceps.
14	•	•	Forceps (accidental hæmorrhage); (?) dead before.
15	•	Slight on surface	Natural breech; head delayed.
17	•	•	Natural vertex.
18	•	Beneath occipital dura mater; into both lateral ventricles, chiefly right	Vertex; rapid delivery through rigid os (<i>vide</i>).
20	•	•	•
21	•	•	(?) Vertex.
23	•	Into frontal lobe (<i>vide</i>)	Forceps; child lived 17 days.
25	•	Slight on surface of temporo-sphenoidal lobes, at base, around medulla, pons, and cerebellum; clot in longitudinal and lateral sinuses	4th breech; accidental hæmorrhage; premature rupture of membranes; rapid delivery.
26	•	Slight at base (skull thin)	•
28	•	Slight over hemispheres; 2 drachms over left temporo-sphenoidal lobe, and over pons and medulla	Primipara, æt. 35; contracted pelvis; in labour 24 hours; low forceps; child lived 1 hour; skull very thin (<i>vide</i>).

Note.—Simple dots in these tables are intended merely to guide the eye; double commas imply identity with the statement in the same column above.

No. of case.	Congestion.	Hæmorrhage.	Mode of delivery.
29	Meninges		Natural vertex.
32	Yellow œdema		Natural vertex.
34		Much on right side of cerebrum, also at base on both sides	Contracted pelvis (3 in.); induction of labour at 7½ months; forearms; child lived 2 days.
35	Brain	(?) Into substance of medulla	Natural vertex; cord round neck (<i>vide</i>).
36	Meninges and brain	At base	Natural vertex.
37	"		Natural vertex.
38	"	At base; under dura mater at depressed part; much around pons and medulla; much on surface at indented part, not on other side	Footling; contracted pelvis; depression of right parietal bone.
39		On surface of and at base of temporo-sphenoidal lobes	Natural vertex.
40	Left side of cortex œdematous; œdema fluid at base		(?) Natural vertex; (?) caul.
41		Into representative of cerebrum	Anencephalus; face presentation.
42		From left middle cerebral vessels (pressed upon by anterior lower corner of parietal bone)	Natural vertex (cord around neck).
43		Considerable on top of both hemispheres (<i>vide</i>)	Skull flattened (left parietal bone under occipital)
44		On surface, both sides; at base; around cerebellum, and between this and medulla; (?) hæmorrhage into medulla	Natural breech; head delayed.
45		Right parietal region, especially at base, between cerebellum and medulla; hæmorrhage extends into spinal canal	Footling (both feet); traction; delivery of head difficult.
47	Edema of brain and meninges		Placenta prævia; version; then natural delivery.
48		Surface of hemispheres; at base; in right lateral ventricle (<i>vide</i>)	Natural footling.
51	Especially of meninges, beneath posterior fontanelle		Impacted breech.
54		Over whole surface; around base; two minute hæmorrhages into floor of fourth ventricle	Prolapsed funis; version; traction and supra-pubic pressure.
55		Both parietal regions and at base. A notch in left parietal distal to ventricle	Breech (extended legs); extraction.

	stained fluid in ventricles		
63	Great, throughout brain and cerebellum	Both Sylvian fissures	(?) Breech with traction.
66	Brain and meninges	Clot in choroid plexuses	
67	"		Natural vertex.
68	"		
69	Much œdema fluid	On surface, at base; into lobes of cerebellum and medulla	Anencephalus; footling; traction.
70		Large clot at base, over temporo-sphenoidal lobes of right side, and over fissure of Sylvius	Icterus; child lived 4 days.
71	Of right hemisphere	Surface of left hemisphere (several drachms), at base; over left side of cerebellum	Version (epilepsy in mother); natural delivery 14 hours later.
72	(Edema of meninges	Surface of left hemisphere	Placenta prævia; version; extraction.
76		Over hemispheres	
78		Blood-like fluid in arachnoid	Vertex; lived 18 hours (<i>vide</i>).
79		Slight at base of cerebellum and around medulla	Contracted pelvis ($3\frac{3}{10}$ in.); forceps.
80		Surface of right hemisphere	
81		All over surface of right hemisphere	Hydrocephalus, spina bifida; skull in-completely ossified.
82		Both parietal regions and at base	Second vertex, natural.
83		Left side and at base	Second breech; forceps; traction on groin.
84		Much over left hemisphere and at base; some hæmorrhage right side (forceps marks over left parietal); hæmorrhage above cerebellum	Forceps (prolapsed funis); skull very thin in lower parietal regions.
85		Much on surface of left hemisphere and at base on both sides	Accidental hæmorrhage; footling; great traction; rigid cervix.
87	Meninges (opaque); œdema fluid at base		
88	Edema; excess of fluid in lateral ventricles		Natural vertex.
89		Beneath upper right parietal bones	Breech; 8 hours labour; natural till shoulders born; child gasped, and was delivered by nurse, dead.
90		Much over right hemisphere ("caput" over right posterior parietal)	Forceps; first vertex.
91		On upper surface, at junction of middle and posterior thirds; but especially under the thin posterior parts of parietal bones	Breech; extended arms; difficult extraction (child's heart beating at birth).

No. of case.	Congestion.	Hæmorrhage.	Mode of delivery.
92	Much, and œdema		Natural breech; head delayed.
93	Meninges and brain	All over cortex and cerebellum	Fourth vertex; difficult forceps.
97	Much, and œdema	Thrombosis of longitudinal sinus	Tedious natural vertex; child died convulsed a few hours later.
98		Much over surface and at base (<i>vide</i>)	Difficult forceps (fracture of right frontal bone; hæmorrhage into left sternomastoid from pressure of point of blade; internal jugular distended from same cause).
100	Intense (meningeal), especially at top, near middle line; also of medulla and choroid plexuses	Thrombosis of longitudinal sinus	Child lived 3 days; vertex.
101		Under left parietal; in Sylvian fissure; large clot in left lateral ventricle	Sudden vertex delivery (skull bones movable, especially left parietal).
102		At base; into tentorium cerebelli, chiefly on left side	Natural vertex; lived 15 minutes.
104		Into medulla (black)	Anencephalus; face presentation.
105		In both lateral ventricles; much on sides of and below temporo-sphenoidal lobes	Natural vertex, 1st twin; lived 44 hours.
106		Much on surface	Natural vertex, 2nd twin; lived 28 hours.
112		On surface of hemispheres	
114		Extensive on upper half of cortex	(Skull compressible); vertex.
115	Meninges and bruin	Considerable over vertex and above cerebellum	Third breech; delayed shoulders.
116	Edema, especially at base	Considerable all over surface, especially at base	Placenta previa; version; slight traction.
117	Of vessels of upper surface of cerebellum	On surface of upper posterior parts of parietal lobes	Natural first vertex.
118	Of falx	All over brain and cerebellum	Third face ($6\frac{1}{2}$ months child).
119	Great (of meninges)	Into tentorium cerebelli, around cerebellum and medulla; thrombosis of longitudinal sinus	Natural vertex; lived 3 days.
120	Of meninges of left side	Much on under surface of left temporo-sphenoidal lobe; some around medulla and around and above cerebellum	Face.
121	Of upper cortex	Slight on surface; much at base around medulla and cerebellum; hæmorrhage into tentorium cerebelli	Vertex; forceps.

	Temporo-sphenoidal lobes			
123	Meninges; especially around medulla and cerebellum	.	.	Natural breech.
124	Meninges; especially in Sylvian fissure; much oedema of surface of temporo-sphenoidal lobes	.	.	(?) Vertex.
125	.	.	.	Fourth vertex; lived 26 hours.
127	Meninges, left side (left parietal bone under right)	.	.	(?) Face.
128	.	.	.	Breech (extended legs).
130	.	.	.	Shoulder presentation; version.

TABLE II.—*Injuries to the Liver.*

No. of case.	Congestion.	Hæmorrhage.	Rupture.	Mode of delivery.
1	General	.	.	Breech; traction.
3	.	.	.	Forceps; prolapsed funis.
4	General	.	.	.
5	"	.	.	Accidental hæmorrhage; version.
6	"	.	.	<i>Conduplicato corpore.</i>
7	Almost black in places	.	.	(?) Breech.
10	.	.	Of posterior part of right lobe	Hydrocephalus; breech; traction.
11	General	.	.	Accidental hæmorrhage; forceps.
12	"	.	.	Forceps.

No. of case.	Congestion.	Hæmorrhage.	Rupture.	Mode of delivery.
13	General	.	.	Natural vertex.
14	At upper surface	.	.	Accidental hæmorrhage; forceps.
15	Slight, general	.	.	Breech.
16	General	Small subcapsular at under surface of right lobe	.	Neglected shoulder; decapitation.
17	At under surface	Covering quadrate lobe	.	Natural vertex.
18	Surface bruised in various places	Of size of a shilling under capsule over lower surface	.	Rapid natural vertex; rigid os.
19	General	.	.	.
21	"	.	.	(?) Vertex.
26	.	Of size of a halfpenny on upper surface	Of capsule	.
27	Bruised upper surface	Subcapsular (produced by crotchet) upper surface	.	Vertex; cephalotripsy.
28	General	Small subcapsular on upper surface, half way from before back to right of coronary ligament	.	Low forceps.
29	.	On upper surface of left lobe, also in canal for umbilical vein	.	Natural vertex.
31	.	On upper surface of right lobe; upper and lower surface of left lobe	.	Natural breech; lived 4 days.
32	General	.	.	Natural vertex.
33	"	.	.	Natural vertex.
34	"	Small, on upper surface of left lobe.	.	Forceps; contracted pelvis; induced labour. Child lived 3 days.
36	.	Large, on upper surface of left lobe	.	Natural vertex.
37	General	.	.	Natural vertex; lived 8 days.
40	"	.	.	(?) Vertex; rapid delivery.
42	"	.	.	Natural vertex.
44	"	.	.	Breech.
46	Slight of upper surface of right lobe	Of size of bean beneath capsule of lower surface of right lobe	.	Version; extraction; craniotomy; rigid cervix.
47	.	Extensive on upper surface of right lobe.	.	Version; slight traction.
48	.	Extensive on upper surface of right lobe.	.	Natural footling.
49	.	Large on upper surface	.	Version; embryotomy.
51	General	(?) Upper surface bruised	.	Impacted breech.
52	"	.	.	Vertex; cephalotripsy.

Case	General	Of upper surface of brain	Of capsule	Of placenta	Of umbilical cord	Of other organs
58	"	Three hæmorrhages on upper surface	"	"	"	Breech; traction.
61	"	Slight on upper surface	"	"	"	Natural vertex; lived 3 hours.
63	"	"	"	"	"	(?) Breech; traction.
64	"	"	"	"	"	Vertex; accidental hæmorrhage.
67	"	On surface of quadrate lobe	"	"	"	Natural vertex.
68	"	"	"	"	"	(Prolapse of funis.)
69	"	"	"	"	"	Footling; traction.
74	"	"	"	"	"	(?) Breech.
82	"	Small on upper surface of right lobe	"	"	"	Second vertex; primipara.
83	"	Several hæmorrhages on lower surface; small hæmorrhage on anterior edge of right lobe	"	"	"	Second breech; forceps; traction on groin.
84	General	Large on upper surface of right lobe	"	"	"	Forceps.
85	"	"	"	"	"	Footling; much traction; cervix rigid.
86	General	"	"	"	"	Natural vertex.
87	"	"	"	"	"	"
88	"	"	"	"	"	Natural vertex.
91	"	Small beneath capsule of quadrate lobe	"	"	"	Breech; extended arms.
93	General	"	"	"	"	Vertex (occiput posterior); forceps.
99	"	Petechial, subcapsular	"	"	"	Vertex (right diaphragmatic hepatic hernia).
101	"	Of size of bean on upper surface of right lobe	"	"	"	Vertex; sudden delivery.
102	"	On upper surface of right lobe	"	"	"	Natural vertex.
103	"	On upper surface of right lobe	"	"	"	Brow; craniotomy.
104	General	"	"	"	"	(Anencephalus) face.
108	"	On both surfaces of right lobe	"	"	"	Vertex; cephalotripsy.
110	General	"	"	"	"	Vertex; placenta prævia.
111	"	"	"	"	"	"
112	"	On surface	"	"	"	"
113	Of lower surface	(?) On lower surface	"	"	"	Natural vertex.
114	General	(?)	"	"	"	Natural vertex.
116	"	Large on upper surface of right lobe	"	"	"	Version; slight traction; placenta prævia.
117	"	Large on both surfaces	"	"	"	Natural vertex.
118	"	Small on upper surface	"	"	"	Face.

No. of case.	Congestion.	Hæmorrhage.	Rupture.	Mode of delivery.
121	General			Forceps.
123	Of fore part of upper and lower surfaces			Natural breech.
124	General			
126		Enormous over upper surface of right lobe		Breech; extended legs.
127	General			(?) Face.
128	(?) Bruised			Breech; extended legs.
130	General, left lobe more than right	Marked bruising of posterior edge of right lobe		Shoulder; version.

TABLE III.—*Injuries to the Kidneys.*

No of case.	Congestion.	Hæmorrhage.					Mode of delivery.
		Around.	Into cortex.	Into hilum.	Into pyramids.	At bases of pyramids.	
1	General, especially at bases of pyramids					(?) On right side	Breech.
4	Great of both	Beneath capsule of left	Of both			(?) On both sides	
6	Of both						<i>Conducticato corpore.</i>
7	Of both, especially of pyramids and at their bases						(?) Breech.
10	Great of both	Subcapsular in right					Breech, traction.
11	Great of pyramids, both						Forceps (? child dead before applied).
12	Of both, especially at lower end of left						Forceps.

	Of both (at bases of pyramids)	.	.	.	lull	.	.	.	.	.	Neglected shoulder (decapitation). Natural vertex.
16	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex (rapid).
17		Between right and supra-renal; also at hilum, appearing externally	.	.	.	.	.	.	.	.	Natural vertex (rapid).
18	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex (rapid).
19	Of both (lower ends)	.	.	.	.	.	.	.	.	.	Natural vertex (rapid).
20	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex (rapid).
21	Of left (especially bases of pyramids)	Into cellular tissue behind right	.	.	.	.	.	.	.	.	(?) Vertex.
22	.	.	.	.	.	.	.	.	.	.	Vertex, forceps; lived 17 days.
23	.	.	.	.	.	.	.	.	.	.	Fourth breech; premature rupture of membranes; rapid delivery.
24	Great of both	.	.	.	.	.	.	.	.	.	Contracted pelvis; forceps.
25	.	.	.	.	.	.	.	.	.	.	Natural vertex.
26	Of right; of bases of pyramids of left	.	.	.	.	.	.	.	.	.	Natural breech; lived 4 days.
27	Of both	Behind both	.	.	.	.	.	.	.	.	Natural vertex.
28	Of right	Into pelvis	.	.	.	.	.	.	.	.	Natural vertex.
29	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex.
30	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex; cord around neck; imperforate anus.
31	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Footing; contracted pelvis.
32	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex.
33	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex.
34	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex.
35	Of both (bases of pyramids)	.	.	.	.	.	.	.	.	.	Natural vertex.
36	Of both (especially left)	Behind both;	.	.	.	.	.	.	.	.	Natural vertex.
37	Of both (cortex)	between them and supra-renals	.	.	.	.	.	.	.	.	Natural vertex.
38	Of both (cortex)	.	.	.	.	.	.	.	.	.	Natural vertex.
39	Of both (cortex)	.	.	.	.	.	.	.	.	.	Natural vertex.
40	Of both (cortex)	.	.	.	.	.	.	.	.	.	Natural vertex.
41	Of both (cortex)	.	.	.	.	.	.	.	.	.	Natural vertex.
42	Of both (cortex)	.	.	.	.	.	.	.	.	.	Natural vertex.
43	Of both (cortex)	.	.	.	.	.	.	.	.	.	Natural vertex.
44	Of both (hilum)	.	.	.	.	.	.	.	.	.	Natural breech (cord pressed upon).

No. of case.	Congestion.	Hæmorrhage.					Mode of delivery.
		Around.	Into cortex.	Into hilum.	Into pyramids.	At bases of pyramids.	
45	Of both	.	.	.	.	.	Breech; traction.
46	Much of both (apices of pyramids and around bases)	.	.	.	.	.	Version; traction.
47	Of both	.	.	Slight of both	.	.	Version; slight traction.
48	.	All around	.	Much of both	.	.	Natural footling.
49	Of both	.	.	.	.	.	Version; embryotomy.
51	Of both (bases of pyramids and hilum)	.	.	.	.	.	Impacted breech.
52	Of both (pyramids)	.	.	.	.	.	Vertex; cephalotripsy.
56	.	.	.	Of both	.	Of both	Breech; extended legs; extension.
57	Of both (bases of pyramids)	.	.	.	.	.	Breech; traction; premature
58	Of both (bases of pyramids)	Left; (?) from ruptured vein	.	.	.	.	rupture of membranes.
61	Of both	Upper part of left (subcapsular)	.	.	.	.	Natural vertex; lived 8 hours.
63	.	.	.	.	.	.	(?) Breech; traction.
65	Great of lower part of left (subcapsular and cortical)	.	.	.	.	.	(?) Vertex.
66	.	Beneath pons-nervum over right	.	.	.	.	(Dilated ureters and kidneys).
67	Of both (bases of pyramids)	.	.	.	.	.	Vertex.
68	Of both	.	.	.	.	.	.
70	Of both	.	.	.	.	.	.
74	Of both (bases of pyramids)	.	.	.	.	.	(?) Breech (asphyxia).
77	Of both (bases of pyramids)	.	.	.	.	.	Vertex.
78	.	.	.	Of both	.	.	Vertex.
							Forceps; contracted pelvis.

						(apices of upper part)		
85	.	.	.	.	.	Of both	.	Footling; much traction; rigid cervix.
87	.	Of both	.	.	.	Of both	.	Natural vertex.
88	.	Of both (bases of pyramids)	.	.	.	.	.	Breech; some traction.
89	.	Of both	.	.	.	.	.	Forceps.
90	.	Of both (bases of pyramids)	.	.	.	.	.	Breech; difficult extraction.
91	.	Of both (hylum)	.	.	.	.	.	Forceps.
93	.	Of both	.	.	.	Of both	.	Vertex.
95	.	Of both	.	.	.	Of both	.	Rapid vertex; rigid cervix.
101	.	Of cellular tissue around both	.	.	.	Of both	.	Natural vertex.
102	.	Of cellular tissue around both	.	.	.	Of both	.	Vertex; lived 28 hours.
106	.	Of both	.	.	.	Of both	.	Vertex; lived 4 days.
107	.	Slight of both	.	.	.	Of both	.	Forceps (placenta prævia).
110	.	Of both (pyramids and hylum)	.	.	.	Of both	.	Third breech; delayed shoulders.
115	.	Of both	.	.	.	Of both	.	Version; traction; rigid cervix.
116	.	Of both	.	.	.	Of both	.	Natural vertex.
117	.	Of both (surface)	.	.	.	Of both	.	Natural vertex; lived 3 days.
119	.	Of right (pyramids of upper half)	.	.	.	Of both	.	Face.
120	.	Of left (bases of pyramids)	.	.	.	Of both	.	Natural breech.
123	.	Of both	.	.	.	Of both	.	(?) Vertex.
124	.	Of both	.	.	.	Of both	.	Fourth vertex.
125	.	Of both (bases of pyramids)	.	.	.	Of both	.	First breech; extended legs.
126	.	Of both (bases of pyramids)	.	.	.	Of both	.	(?) Face.
127	.	Of both	.	.	.	Of both	.	Breech; extended legs.
128	.	Of both (bases of pyramids)	.	.	.	Of both	.	Shoulder; version.
130	.	Of both	.	.	.	Of both	.	

TABLE IV.—*Injuries to the Supra-renal Capsules.*

No. of case.	Congestion.	Hæmorrhage around.	Hæmorrhage into the medulla.	Rupture.	Mode of delivery.
3	Of right	Behind left (from rupture)	Of both	Of left	Forceps (prolapsed funis).
4	.	.	.	.	.
5	.	.	Of both	.	Version.
6	Great	.	.	.	<i>Conducatore corpore.</i>
7	Slight	.	.	.	(?) Breech.
10	Of left	Into peritoneum	Of right	Of right	Breech; traction (hydrocephalus).
11	Slight	.	.	.	Forceps (P dead before).
12	Of both	.	.	.	Forceps.
15	Of left	.	Of left	.	Natural breech.
17	.	Between right and kidney	.	.	Natural vertex (caul).
26	Of both	.	Of both	.	.
29	"	.	.	.	Natural vertex; delay with body.
32	"	.	.	.	Natural vertex.
34	"	.	Of left	.	Forceps; contracted pelvis; induced labour.
35	Of right	.	Of left	.	Natural vertex (large body).
37	Of both	.	.	.	Natural vertex.
38	.	.	Of both; of left in patches	.	Footling; contracted pelvis.
39	.	.	Of both	.	Natural vertex.
47	Of both	.	.	.	Version; slight traction.
48	"	.	.	.	Natural footling.
49	.	.	Of both	.	Version; traction; embryotomy.
51	Of both (large organs)	.	.	.	Impacted breech.
52	.	.	Of lower half of left	.	Vertex; cephalotripsy.
60	.	All round right	Of right	Of right	Contracted pelvis; large child; forceps; version.
61	.	.	Of both	.	Natural vertex; lived 3 hours.

71	"	.	.	.	Of both	.	Version; natural delivery.
74	"	.	.	.	Of left (slight)	.	(?) Breech.
77	Of left (much)	.	.	.	Of both	.	Natural vertex.
78	.	.	.	.	Of both	.	Natural vertex.
79	.	.	.	.	Between supra-renal and kidneys on both sides	.	Forceps; contracted pelvis ($3\frac{3}{16}$ in.).
82	Of left	.	.	.	.	.	Second vertex.
83	Of right (slight)	.	.	.	Of left	.	Second breech; forceps; traction.
84	Of left	.	.	.	.	.	Forceps (prolapsed funis).
85	.	.	.	.	Of right	.	Footling; traction; rigid cervix.
89	.	.	.	.	Slight at upper part of both	.	Breech; natural till body born, then trac- tion.
91	Of both	.	.	.	Of left (slight)	.	Difficult breech; extraction.
100	Of right	.	.	.	.	.	Vertex (lived 3 days).
101	Of both	.	.	.	.	.	Vertex; sudden delivery; rigid os.
102	.	.	.	.	Of both	.	Natural vertex.
104	Between kidneys and supra-renal Of both	.	.	.	.	.	Face; anencephalus.
115	"	.	.	.	.	.	Third breech.
116	(much) Of both	.	.	.	.	.	Placenta prævia; version; slight traction.
117	"	.	.	.	Of left (slight)	.	Natural vertex.
122	"	.	.	.	.	.	Placenta prævia; version, then natural deli- very.
124	"	.	.	.	.	.	Lived 1 day.
125	"	.	.	.	.	.	Natural 4th vertex; lived 26 hours.
127	"	.	.	.	.	.	(?) Face.
128	"	.	.	.	(?) Of right	.	Breech; extended legs.
130	"	.	.	.	.	.	Shoulder; version.

TABLE V.—*Injuries to the Lungs, &c.*

No. of case.	Contents of pleura.	Pulmonary congestion.	Pulmonary hæmorrhage.	Mode of delivery.
2	A little excess of fluid (pleura opaque in patches)		Chiefly at bases, causing pneumonia	Transverse; version, much traction; lived 4 days.
3			On both sides (subpleural)	Forceps; prolapse of funis.
4			Subpleural petechiæ	
5		General	Subpleural petechiæ	Version.
6			Subpleural petechiæ	<i>Conducatio corpore.</i>
9		Of thin edge of bases		Version; placenta prævia.
10	A little blood-stained fluid		Echymoses on surface, especially at bases	Breech, traction; hydrocephalus.
11		Of lungs, larynx, and trachea	Subpleural, at bases and edges	Forceps.
13		Great, of lower lobes, which exude a bloody fluid		Second vertex; labour lasted 2 hours.
15			Subpleural over lungs; into thin edge of lower lobe on left side	Natural breech; delay with head.
16		Very great, of right lung	Into right lung, solid (<i>vide</i>)	Neglected shoulder, decapitation.
17			Subpleural, at base of right middle lobe and at thin edge of left lower lobe	Natural vertex (canal over head).
18		Of larynx and trachea		Sudden, natural.
19		General	Petechiæ on surface and between lobes	
20	A few drops of red fluid in right	Of lower edges		
25		Great, general.		
27			Bruised left upper lobe (evulset); subpleural hæmorrhage at lower edge of right	Breech; rapid delivery; membranes ruptured.
28		Of larynx		Cephalotripsy.
				Forceps.

37	.	General	.	.	.	Subpleural	.	.	Vertex; lived 8 days.
38	.	.	.	.	.	Small into substance of left	.	.	Contracted pelvis; footling.
39	A drachm of fluid in each	Great, especially of lower lobes	.	.	.	Petechiæ	.	.	Natural vertex.
41	.	Great, especially at bases	.	.	.	(?) Into lower lobes	.	.	Face (anencephalus).
47	A little reddish fluid in left	Of bases, especially left	.	.	.	Petechiæ; hæmorrhage into thin edge of left	.	.	Version; placenta prævia.
48	.	Of thin edges of lower lobes	.	.	.	Into left	.	.	Natural footling.
49	.	Of thin edges	.	.	.	Into apex of right	.	.	Version; embryotomy.
51	.	.	.	.	.	.	.	.	Impacted breech.
57	.	General	.	.	.	Into both apices; into left base and edge	.	.	Breech; traction; rigid cervix.
58	.	.	.	.	.	Into both apices; subpleural hæmorrhage at posterior edge and lower surface of right	.	.	Contracted pelvis; forceps; version; traction.
60	.	General	.	.	.	(?) Into left base (almost black)	.	.	(?) Breech; traction.
63	One drachm of bloody serum in left; a few drops in right	Both lower lobes, especially left	.	.	.	Petechiæ	.	.	Vertex.
64	.	General	.	.	.	.	.	.	.
65	One drachm of serum in left; less in right	.	.	.	.	Much into left lung and into lower lobe of right	.	.	Footling; traction.
69	One drachm of blood	.	.	.	.	.	.	.	(?) Breech (caul).
74	.	Of larynx and trachea	.	.	.	.	.	.	Vertex.
78	Bloody fluid	Of lower left lobe	.	.	.	Petechiæ	.	.	Forceps; contracted pelvis.
79	.	.	.	.	.	Petechiæ	.	.	.
80	.	General	.	.	.	Petechiæ	.	.	Second vertex.
82	Excess of fluid	.	.	.	.	Petechiæ	.	.	Second breech; forceps; traction.
83	.	Of thin edges	.	.	.	Subpleural and intra-pulmonary of posterior border of right	.	.	Footling; much traction; rigid cervix.
85	One drachm of bloody fluid in each	.	.	.	.	and thin edge of both bases	.	.	Natural vertex.
88	.	General	.	.	.	Petechiæ	.	.	Breech.
92	.	.	.	.	.	.	.	.	Vertex.
100	.	Of bases	.	.	.	.	.	.	Natural vertex.
102	.	.	.	.	.	Petechiæ	.	.	.

No. of case.	Contents of pleura.	Pulmonary congestion.	Pulmonary hæmorrhage.	Mode of delivery.
104	.	Of larynx	.	Face (anencephalus).
105	.	.	Into bases.	Vertex; first twin; lived 44 hours.
106	.	Slight	.	Vertex; second twin; lived 28 hours.
107	Half a drachm of serous fluid in left; four drachms of bloody fluid in right	General	Into both bases, especially right	Vertex; membranes a long time ruptured; labour lasted 48 hours.
109	.	.	Into thin edges of bases	(Ascites); vertex; (?) traction.
110	.	.	Into thin edges of bases	Forceps; placenta prævia.
113	.	.	Petechiæ	Vertex; labour lasted 4½ hours.
116	A little blood-stained fluid	Of both	.	Placenta prævia; version.
117	.	.	Into both (almost black)	Natural first vertex.
119	Excess of fluid in both	Great	.	Natural vertex; lived 3 days.
120	.	General	Petechiæ	Face.
121	.	Of larynx	.	Forceps.
127	.	Of larynx and trachea (contain mæconium)	Petechiæ	(?) Face.
129	.	.	(?) Into thin lower edges	Breech; extended legs; traction; lived 6 days.
130	.	General	.	Shoulder; version.

TABLE VI.—*Injuries to the Testis, &c.*

No. of case.	Congestion.	Hæmorrhage.	Hydrocele.	Hæmatocele.	Mode of delivery.
3	Of testis				Forceps (prolapsed funis).
6	Of spermatic cords . . .				<i>Conduplicated corpore.</i>
12	Scrotum ; left spermatic cord				Forceps.
18					Accidental hæmorrhage; sudden delivery; rigid os; vertex presentation.
21	Edema of dartoid				(?) Vertex.
25	Edema of dartoid	Into both testes (black)	On both sides	Of both cords	4th breech; membranes ruptured; rapid birth.
26	Of testes and cords . . .			Of both processus vaginales	
28	Of spermatic cords; œdema of scrotum				Forceps; contracted pelvis.
34	Of mediastinum testis . .				Forceps; contracted pelvis; induction of labour; lived 2 days.
35	Of surface of testes, and of mediastinum, and of cord				Natural vertex; cord around neck; imperforate anus.
36	Slight, of testes				Natural vertex; cord around neck.
37	Of mediastinum; (?) hæmorrhage				Natural vertex; lived 8 days.
39	Of mediastinum, both; of right cord				Natural vertex.
45	Of spermatic cords (? hæmorrhage); of testes	Into right testis . . .			Footling; traction.
48	Of cords and testes . . .				Natural footling.
49	Of testes	Into testes			Version; embryotomy.
51	Edema of right cord; red œdema of scrotum	Into both testes, especially right			Impacted breech.
58				Of processus vaginalis and cord, right side	Breech; premature rupture of membranes; traction.

No. of case.	Congestion.	Hæmorrhage.	Hydrocele.	Hæmatocoele.	Mode of delivery.
59	Of testes		On both sides		Contracted pelvis; forceps; version.
60	Of testes		Of both		(Dilated ureters.) Hemicephalus; footling; traction. (?) Breech; caul.
66	Of right cord				
69	Of mediastinum				
74	Of cord				
75	Of cord, especially left; of left testis				
81		Into both testes, especially left			(Spina bifida; hydrocephalus.)
83	Edema of dartoid	Into mediastinum and dartoid	On both sides	On both sides	2nd breech; forceps; traction on groin.
84	Red œdema of scrotum	Into mediastinum			Forceps; prolapsed cord.
87	Of testes	Into right testis (black spots)			Natural vertex.
88	Of both testes				
90	Of mediastinum	Into testes and dartoid			Forceps.
91					Breech; extended arms.
92	Slight, of testes				Natural breech.
93	Of right testis	Into left testis	On both sides		Forceps.
102	Of testes, especially left				Natural vertex.
103	Of testes				Hydrocephalus; brow presentation; craniotomy.
105	Of testes				Natural vertex.
110		Into both testes			Placenta prævia; forceps.
116	Slight, of testes				Placenta prævia; version; slight traction.
121	Slight, of testes				Forceps (large child).
123	Of scrotum and spermatic cords	Into both testes			Natural breech.
126	Of right mediastinum testis (which was in the abdomen)	Into left testis (which was in the scrotum)			Breech; extended legs.
127	Of spermatic cords and testes	(?) Into both testes		(?) Of cords	(?) Face.

TABLE VII.—*Injuries to the Uterus.*

No. of case.	Congestion.	Hæmorrhage.	Mode of delivery.
11	Of Fallopian tubes and subperitoneal uterine tissue	.	Forceps; (?) dead before applied.
15	Of ovaries, body of uterus, and cervical cavity for $\frac{1}{3}$ in. from external os	.	Natural breech.
32	Of subperitoneal uterine tissue, behind and in front	Into subperitoneal uterine tissue at posterior surface	Natural vertex.
33	Of superficial veins	.	Natural vertex.
38	Of uterine mucous membrane, and subperitoneal tissues	Into mucous membrane of body to a depth of about $\frac{1}{3\frac{1}{2}}$ in.	Contracted pelvis; footling.
40	Of subperitoneal vessels	.	Very rapid delivery.
56	Of mucous membrane of cervix and body of uterus	Into subperitoneal tissues at back of uterus	of Breech; extended legs; extraction.
65	Of body of uterus	.	.
78	.	Into cellular tissue around uterus and ovaries	Vertex; (?) septicæmia in utero.
86	Of Fallopian tubes	.	Natural vertex.
89	Of uterus and Fallopian tubes	.	Breech; premature rupture of membranes.
100	Of uterus, ovaries, and Fallopian tubes	.	Vertex; lived 3 days.
115	Of body of uterus and Fallopian tubes	(?) Into mucous membrane of body of uterus	Third breech; delayed shoulders.
117	Of subperitoneal vessels in front	.	Natural vertex.

TABLE VIII.—*Injuries to the Spleen.*

No. of case.	Congestion.	Hæmorrhage.	Mode of delivery.
7	Slight, general	.	(?) Breech.
12	Great (almost black)	.	Forceps.
13	General	.	Vertex.
14	Great, general	.	Forceps.
24	Slight, general	.	(Icterus; lived 4 days).
25	General	.	Fourth breech; accidental hæmorrhage.
60	General	.	Forceps (two applications).
61	General	To naked eye the hæmorrhage appears disseminated; under microscope diffuse	Natural vertex; died in convulsions 3 hours later.
63	General	.	(?) Breech; traction.
64	General	.	Natural vertex; membranes prematurely ruptured.
69	Great, general	.	Footling; traction.
102	General	Under capsule and into substance	Natural vertex; artificial respiration; died suddenly 15 minutes after birth.
104	Great, general	.	Face (anencephalus).
107	Great (black)	.	Vertex; lived 4 days.
113	Great, general	.	Vertex (4½ hours in labour); lived 14½ hours.
115	General	.	Third breech.
116	General	.	Version; slight traction; placenta previa.
117	Great (as black spots)	.	Natural vertex.
127	.	Much, into substance and beneath capsule	(?) Face.
128	Great, general	.	Breech; extended legs; traction.
129	General	.	Natural breech; lived 6 days.
130	General	.	Shoulder; version.

PART III.

INJURIES TO THE BRAIN (see Table I).

A. *Congestion and Œdema of the Membranes of the Brain.*

Congestion or œdema was met with in 45 cases (alone in 24 cases, associated with hæmorrhage or thrombosis at other parts of the brain in 21 cases). It is to be noted that most of the brains which showed meningeal hæmorrhage were also congested.

Of the four cases of *thrombosis of the longitudinal sinus*, one was a breech presentation and was still born; the rest were natural vertex presentations, two of which lived three days and one a few hours.

Œdema of the meninges of the brain was found in 12 cases. They varied in the duration of labour and in the presentation and mode of delivery. In none was the forceps used, and four occurred in cases of placenta prævia. The brain-substance was often found congested.

B. *Hæmorrhage into the Substance of the Brain.*

This rare lesion was met with once only in normally developed children and thrice in anencephalic fœtuses.

Case 23 was delivered with some difficulty by forceps. The frontal bones were very thin and depressible. The child lived seventeen days, and died of hæmorrhage into the pyramids of the kidneys. There was a deep bruise, produced by the forceps, in the skin over the right parietal bone; the bone was not fractured, but immediately under the skin bruise, at the inner part of the right frontal lobe and about one inch from the anterior extremity, was a hæmorrhage of the size of a filbert in the substance of the hemisphere near the upper surface.

There was a slight meningeal hæmorrhage over the seat of the apoplexy.

Microscopic examination showed the brain substance ploughed up by the effusion, and hæmorrhage on the surface of the brain beneath and within the substance of the pia mater and arachnoid.

In the anencephalic cases hæmorrhage into the medulla occurred twice, and into the cerebellum once.

c. Hæmorrhage into and beneath the Membranes of the Brain
(Pl. III, fig. 1).

This is by far the most important lesion of the brain, and has excited attention chiefly on account of the writings of Cruveilhier and McNutt. The greater part of the hæmorrhages were into and beneath the arachnoid and the pia mater, occasionally also between the dura mater and the skull, and sometimes into the tentorium cerebelli and the falx. Hæmorrhage into the pia mater or arachnoid was found in 53 cases, or 40·7 per cent.

(a) *Hæmorrhage over the convexity of the brain.*

(a) *Bilateral hæmorrhage* was found . 29 times.

Of which *general* bilateral hæmorrhage was found . . 18 „

Limited to temporo-sphenoidal lobes . . 4 „

„ upper part of cortex . 4 „

„ parietal regions . 2 „

„ Sylvian fissures . 1 „

(β) *Hæmorrhage on the right side* was found . . 10 times.

Of which *diffuse* hæmorrhage was found . . 4 „

Limited to parietal regions . 3 „

„ Sylvian fissure . 1 „

„ Sylvian fissure and temporo-sphenoidal lobe . 1 „

„ temporo-sphenoidal and occipital lobes . 1 „

DESCRIPTION OF PLATE III.

Illustrating Dr. Herbert Spencer's paper on Visceral
Hæmorrhages in Still-born Children.

FIG. 1, CASE 125.—A brain showing meningeal hæmorrhage (with several clots) over the right temporo-sphenoidal and occipital lobes. *Nat. size.*

FIG. 2, CASE 17.—A kidney laid open, showing hæmorrhage into the loose connective tissue of the hilum ; the pelvis has been slit up so as to expose the hæmorrhage. *Nat. size.*

FIG. 3, CASE 23.—A section of a kidney showing hæmorrhage into the pyramids. (The infant died from suppression of urine on the seventeenth day.) *Nat. size.*

FIG. 4, CASE 126.—A section of a liver showing extensive hæmorrhage beneath the capsule of the right lobe, which is compressed and flattened by the effused blood. The specimen had been preserved in spirit when the drawing was made ; in the fresh state the hæmorrhage was black, and an inch and a quarter in thickness, and the liver dark red. *Nat. size.*



4.

(γ) *Hæmorrhage on the left side* was
found 10 times.

Of which *diffuse* hæmorrhage was
found 4 „

Limited to Sylvian fissure 3 „

„ temporo-sphenoidal lobe 3 „

(b) *Hæmorrhage at the base of the brain*
occurred 35 times.

Of which *diffuse* hæmorrhage occurred . 30 „

Limited to base of temporo-sphenoidal
lobes 3 „

„ surface of cerebellum 2 „

In 6 cases the hæmorrhage was limited to the base,
there being no intra-cranial hæmorrhage elsewhere.

(c) *Hæmorrhage into the ventricles* occurred . 7 times.

Into the right lateral ventricle 1 „

„ the left „ „ 1 „

„ both „ „ 2 „

„ both choroid plexuses 2 „

„ the fourth ventricle 1 „

The largest amount of blood found in the lateral ven-
tricles was in the shape of a clot of blood of the size of
half a pigeon's egg.

(d) *Hæmorrhage between the dura mater and the skull*
was found in a few cases associated with fracture of the
overlying bone. These hæmorrhages were usually of
slight extent and thickness.

Mode of Presentation and Delivery of Cases with Meningeal Hæmorrhage.

Of the 53 cases of meningeal hæmorrhage I have notes
of the presentation and delivery in 46.

By forceps were delivered 11 cases.

As natural vertex were delivered 13 „

„ breech or footling were delivered . 15 „

(12 of these difficult).

„ face were delivered 2 „

By version „ 5 „

Among the 130 bodies examined the forceps was employed fifteen times in vertex presentations. Of these 15 cases, 12 had cerebral hæmorrhage (11 meningeal, 1 intracerebral). Of the remaining 3 cases, 2 were dead before the forceps was employed. In the other case the forceps was merely applied to hold the head in the brim, and was not used to deliver, in a case of placenta prævia. We have here then the interesting and remarkable fact that cerebral hæmorrhage was found in every case in which the forceps was employed to deliver living children who died during or shortly after birth.

If we contrast with this the result of the normal vertex deliveries we find that only $\frac{13}{38}$ ths (or about one third) had cerebral hæmorrhage, and of this third nearly one half were not actually stillborn. Similarly in breech and footling cases $\frac{15}{26}$ ths, and in version cases $\frac{5}{13}$ ths had meningeal hæmorrhage.

The frequency of cerebral hæmorrhage would therefore seem to be greatest with forceps delivery and least with natural head delivery, and to be greater when the breech or foot presents naturally than after version. I have not notes of the duration of labour in all the cases, but hæmorrhage may occur in children born after the most rapid labours (18, 40, 101), and in very small and very large children (63, 93). The mothers may be primiparæ or multiparæ.

There are, however, two conditions to which I wish to draw special attention as determining causes of meningeal hæmorrhage, namely, *softness of the skull bones* and *increased mobility of the bones* from laxity of the sutures, and particularly of the lower edge of the parietal bone.

Instances will be found in Table I of hæmorrhage into the substance of the brain (23), and on the surface and base of the brain (26, 28, 91) occurring at the places where the bones are thin, and one (38) showed hæmorrhage only at the part where the bone was permanently depressed as a result of delivery through a contracted pelvis.

Where the sutures were lax, and the bones consequently

very moveable, hæmorrhage was noticed in many cases. As stated above, in eleven instances hæmorrhage was found limited to the parietal region or the Sylvian fissure, that is, to the part drained by the great anastomotie vein; in many of these cases it was obvious that the effusion was due to the clamping of the vein from the pressure of the lower anterior corner of the parietal bone, which immediately overlies the main trunk of the vessel. In other cases, where the hæmorrhage was more diffuse, it is more than probable that the depressibility of this part of the bone was an important factor in the causation of the hæmorrhage, though it was less demonstrable than in the cases just mentioned.

The above observation leads me to regard the part occupied by the lower anterior portion of the parietal bone as the most vulnerable part of the child's head. Indeed, the condition of the whole of the squamous suture is of the utmost importance to the welfare of the child. I have seen it so lax in a premature stillborn child that the lower edges of the parietal bones could be made almost to meet by transverse pressure with the fingers, so that the edges nearly cut the brain in two.

Besides these local causes of hæmorrhage, others act by producing fulness of the vessels of the brain, such as coiling of the cord around the child's neck, clamping of the internal jugular vein by the point of the forceps blade, and pressure on the neck by the parturient canal, of all of which instances will be found in the cases described.

The *general* causes of the hæmorrhage will be discussed later on.

INJURIES TO THE SPINAL CORD.

The spinal cord was examined in 44 cases only. In no case was there separation of the vertebræ.

In 5 cases the cord, membranes, and surrounding cellular tissue were normal; in none of these was traction employed; three were apparently natural vertex deliveries;

in one version was employed, followed by natural delivery ; in 1 case the forceps was employed to hold the head in the pelvic brim, but not to deliver.

In 18 cases there was congestion or œdema :

Congestion of the whole spinal cord was noticed in	2 cases.
Congestion of the whole anterior cornua in	3 „
„ „ surface vessels in	7 „
Congestion and œdema of the cellular tissue outside the theca	9 „

In 30 cases there was hæmorrhage :

Outside the theca	21 cases.
Between dura mater and arachnoid	2 „
Into arachnoid	6 „
Beneath pia (in one case dipping into anterior fissure)	3 „
Into the whole thickness of the cord	1 „
Into anterior cornua (2 in lumbar, 1 in cervical, and one at various levels, but only one proved microscopically)	4 „
Into Goll's column in lumbar region	1 „

In 29 out of the 30 cases I have notes of the delivery.

There were delivered naturally as cephalic cases	6
„ „ „ breech or footling cases	13
„ „ artificially by version (in all traction was employed)	4
„ „ artificially by forceps	4
„ „ „ cephalotripsy	2

To compare with this, I give a table of the remaining 14 cases (in which the cord was examined and no hæmorrhage found). Of these :

There were delivered naturally as cephalic cases	10
„ „ „ breech or footling cases (1 an easy breech lived two days)	2
„ „ artificially by version (no traction)	1
„ „ „ forceps (dead before applied)	1

A comparison of these two tables, and the fact that, where hæmorrhage was found, the proportion of normal cephalic cases to cases presenting by the lower extremity (naturally or by version) is as 6 to 17, whereas in all the cases examined the similar relation is as 16 to 20, shows that spinal hæmorrhage is greatly favoured by the presentation of the lower extremity. This is probably due partly to the greater compression undergone by the soft parts, and to the consequent driving of the blood to the central organs, and partly to the traction sometimes employed.

Microscopic examination of the *medulla* of Case 104 (anencephalus), at about a quarter of an inch from the upper end, shows hæmorrhage into the meninges, and numerous small hæmorrhages scattered over the surface of the section; the largest of these apoplectic foci are as big as small pins' heads. Examination of the *cervical cord* of the same case shows great congestion of the meninges and the escape of some blood into them. In the centre of the section is a large focus of hæmorrhage measuring a millimetre across, and there are several smaller foci scattered through the section. The hæmorrhages have rendered the section very friable. Examination of the *lumbar cord* of this case shows great congestion of the meninges (the vessels in the anterior fissure being particularly full), great congestion of the substance of the cord, and a few small scattered extravasations. The whole of one Goll's column is permeated with extravasated blood, the corresponding column on the other side being comparatively healthy. The large multipolar cells have the spaces around them dilated and occasionally filled with blood corpuscles, which sometimes press upon the cells and appear, in places, to have caused rupture of their processes.

INJURIES TO THE LIVER (see Table II).

Well-marked *congestion* of the liver was found in 54 cases. In 14 of these it was combined with hæmorrhage.

Hæmorrhage was found in 37 cases, *i.e.* in 28·46 per cent.

Hæmorrhage on the upper surface was	found in	. 24 cases.
„ on the lower surface	. 8	„
„ on both surfaces	. 3	„
„ at the posterior edge	. 2	„

Of the cases with hepatic hæmorrhage there were delivered :

As head presentations	. 13 cases.
As breech or footling presentations	. 8 „
By version	. 5 „
By forceps	. 3 „
By cephalotripsy	. 5 „
By decapitation	. 1 case.
Conduplicato corpore	. 1 „

On comparing this with the table of the presentation and delivery of all cases, and on referring to the history of the individual cases, it is seen that hepatic hæmorrhage is but little dependent upon the mere presentation of the child (whether by the upper or lower pole), but rather upon the mode of delivery, and is especially liable to occur in those cases in which the liver is unduly pressed upon from any cause, such as the large size of the abdomen or the small size of the cervical canal or an impacted breech or shoulder.

These hepatic hæmorrhages are amongst the most striking phenomena met with in autopsies of stillborn infants. They have been noticed by Weber, Ancelon, and Birnbaum, and have doubtless attracted the attention of many other observers. They usually appear as large blebs filled with blood upon the upper surface of the liver, and generally nearer the anterior than the posterior edge ; they may be single or multiple, and vary greatly in extent.

The largest I have seen occupies the greater part of the upper surface of the right lobe, and measures nearly an inch and a quarter in thickness; it occurred in a case of breech presentation with extended legs, and was probably due to the pressure of the thigh upon the organ (Pl. III, fig. 4). The blood is usually under the capsule, which is raised up from the hepatic tissue, and occasionally, but rarely, is ruptured (26, 85). On the inferior surface the quadrate lobe seems especially liable to this form of hæmorrhage; I have three times found the hæmorrhage limited to this part. In one case I found a hæmorrhage on the upper surface of each lobe, accurately limited externally by the edge of the thorax on each side; in another specimen the hæmorrhage only occurred at the part of the left lobe which underlay a congenital gap in the left side of the abdominal wall. These cases seem to show that the hæmorrhage occurs in the area least supported, rather than at the point of greatest external pressure; but it may, of course, be produced by the direct injury of instruments, as in embryotomy (49). Sometimes the blood can be made to flow about under the raised capsule by changing the position of the organ; but usually the capsule is sufficiently tense to prevent this. When the bleb is pricked the blood is found to be fluid and dark, and, on slitting up the capsule, a blackish-red surface is exposed; but no laceration can usually be seen. In rare cases (10) the liver is extensively ruptured, and blood has escaped from the rupture into the abdominal cavity, and is partly coagulated between the edges of the tear.

In a few cases the posterior edge of the liver, where it is attached to the diaphragm, has a deeply bruised appearance (probably owing to its being the most fixed part). In a case of right-sided diaphragmatic hernia sub-capsular petechiæ were found in that portion only of the liver which was within the thorax; they exactly simulated "Tardieu's spots" in the lungs.

Microscopic examination shows great dilatation of the capillaries, and extravasation of corpuscles and hæmo-

globin beneath the capsule and into the substance of the organ.

INJURIES TO THE KIDNEYS (see Table III).

Congestion of this kidney was noticed in 67 cases. The part of the organ in which congestion is most frequently met with is at the bases of the pyramids, where the large venous network exists. Next in frequency comes congestion of the whole organ; then congestion of the pyramids on one or both sides; least frequent is congestion of the cortex. Congestion and œdema of the connective tissue of the hilum is also not uncommonly observed, and I have found the small vessels inside and outside the pelvis and ureter greatly distended with blood.

Hæmorrhage was found in 38 cases:

Around the kidney or beneath the capsule in 13 cases.

Into the cortex	.	.	.	4	„
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Into the pyramids	.	.	.	5	„
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At the base of the pyramids	.	.	.	6	„
-----------------------------	---	---	---	---	---

Into the hilum	.	.	.	22	„
----------------	---	---	---	----	---

From this table it will be seen that the most frequent hæmorrhagic lesion of the kidney is effusion into the loose cellular tissue of the hilum (Pl. III, fig. 2); often some œdema of this tissue is also found. The blood can sometimes be seen externally as a black patch at the hilum of the organ, sometimes as an extensive effusion in that situation. On making a vertical section of the kidneys the blood is found to occupy the space around the pelvis of the organ between it and the overlapping renal substance, and, on microscopical examination, the fibre-like cells of this loose tissue are seen to be separated by red corpuscles. Hæmorrhage beneath the capsule was usually localised, and was once associated with hæmorrhage into the cortex of the organ (4). In this case it seemed to have been produced by pressure from without.

Hæmorrhage into the cortex appeared either as dark-

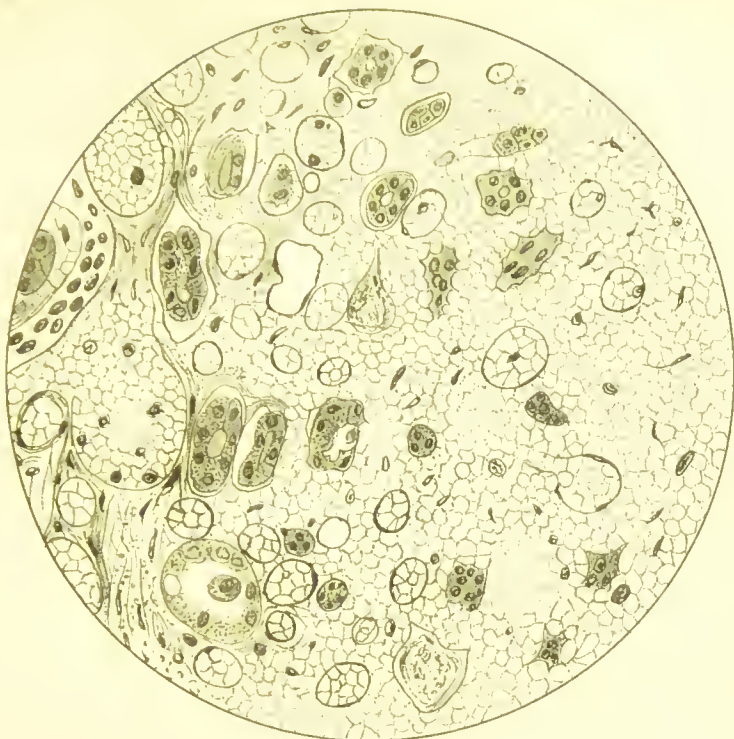
DESCRIPTION OF PLATE IV.

Illustrating Dr. Herbert Spencer's paper on Visceral
Hæmorrhages in Still-born Children.

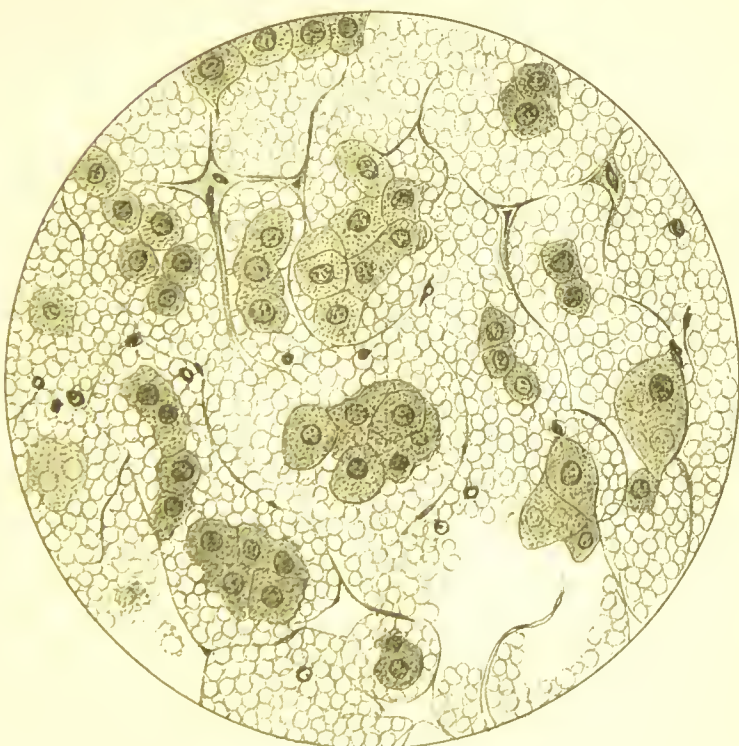
FIG. 1, CASE 23.—A microscopic section (somewhat oblique) of a pyramid of the kidney, showing capillaries and tubules separated by effused blood, the tubules compressed, and some of the cells having the tubules in a state of necrosis. (*High power.*)

FIG. 2.—A microscopic section of the medulla of the supra-renal capsule, showing an early stage of hæmorrhage. The medullary cells are widely separated by the effused blood, and some of the cells appear to contain red corpuscles. (*High power.*)

1



2



red mottling of this part or as dark-red streaks extending in from the surface.

Hæmorrhage into the pyramids occurred in 5 cases. In them the pyramids were of a dark-brown red, black-red, or almost black colour, were raised above the general surface when a section was made, and the effusion of blood had almost or completely obliterated the striated appearance which is so marked a feature in the healthy organ. In one case the hæmorrhage was confined to the apices of the pyramids, and in one to the apices in the upper part of one kidney.

These pyramidal hæmorrhages may cause suppression of urine in the first few days of life, as in Case 23 (for which I am indebted to Dr. Sydney Ringer) (Pl. III, fig. 3, and Pl. IV, fig. 1).

Of the 38 cases of renal hæmorrhage I have notes of the presentation and delivery in 34; they were as follows:

Natural head presentation	.	.	13 cases.
Natural breech or footling	.	.	14 „
Forceps	.	.	4 „
Podalic version.	.	.	4 „

Since the number of cases delivered head-first is practically equal to the number delivered breech-first, while in all the cases examined the ratio of head presentations to breech presentations is as 58 to 39, it follows that renal hæmorrhage is favoured by breech or footling delivery.

INJURIES TO THE SUPRA-RENALS (see Table IV).

Either congestion or hæmorrhage was observed in 53 cases, congestion (alone) being met with twenty-seven times.

Hæmorrhage around the organ was found in 6 cases, in 3 of which it was confined to the right side. A favourite seat is between the kidney and supra-renal, also in the sulcus on the anterior surface; sometimes it occurs behind the organ, and sometimes it completely envelopes it.

Hæmorrhage into the cortex and beneath the envelope was noticed on two or three occasions [Pl. V, fig. 1].

Hæmorrhage into the medulla occurred in . 24 cases.

„	„	on both sides in	. 12	„
„	„	on the right side in	4	„
„	„	on the left side in	8	„

The hæmorrhage had burst through and extensively ruptured the capsule in 3 cases. Of these I have notes of the delivery in 2; they were large children, one weighed 8 lbs., was hydrocephalic, presented by the breech and was delivered by traction; the other weighed $8\frac{3}{4}$ lbs. and was delivered by version and traction through a contracted pelvis.

Of the 24 cases of hæmorrhage into the medulla of the supra-renal capsule, I have notes of the delivery in 22.

Of these were delivered as natural vertex . 7 cases.

„	„	as breech or footling	8	„
		(7 with traction)		
„	„	by podalic version .	4	„
		(2 with traction)		
„	„	by forceps	. 2	„
„	„	by cephalotripsy	. 1 case.	

From this it will be seen that delivery by the lower pole (especially when traction is employed) greatly favours the production of this injury.

The normal supra-renal capsule in the new-born child shows on section a narrow, yellowish-grey cortex and a reddish-brown medulla, along the middle of which is a thin red line where the halves of the medulla are apposed, and in this line (usually about its middle) is a small, round, dark-red spot, which is the section of the central vein; occasionally there are two or more such veins along the central line.

When the medulla of the organ assumed a deep red or black-red colour encroaching upon the cortex, and differed thus very obviously from organs which show no injury (either to the naked eye or the microscope), the organ has been considered to be “congested;” in every case

DESCRIPTION OF PLATE V.

Illustrating Dr. Herbert Spencer's paper on Visceral
Hæmorrhages in Still-born Children.

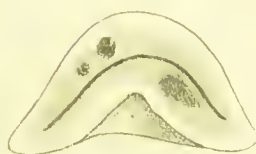
FIG. 1.—A section of a supra-renal body (preserved in spirit), showing hæmorrhage beneath the capsule. *Nat. size.*

FIG. 2, CASE 38.—A section of a supra-renal body, showing three small hæmorrhages in the medullary portion. *Nat. size.*

FIG. 3, CASE 6.—A microscopic section of a testis and epididymis, showing extensive hæmorrhage (self-stained orange) into the body of the testis; the epididymis is comparatively free from hæmorrhage. Some effusion of blood has occurred into the loose connective tissue at the back of the epididymis. (*Low power*; section stained with hæmatoxylin.)



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where congestion is mentioned the condition was very distinct, and when the organ was ruptured externally by the effused blood, or converted into a sac of fluid blood, or its walls separated instead of being apposed, so that a wide line of a deep black-red colour was seen; or, again, where distinct spots of hæmorrhage existed in the organ, it has been placed in the table under "hæmorrhage."

The above limitation of the term congestion is, of course, arbitrary, and, indeed, by comparison with the organs of adults or young children, almost every supra-renal in the new-born may be described as "congested."

But the same might be said of most fœtal organs and notably of the liver, which differs very markedly in appearance at birth from that of the child even a few days old. This note will, I think, explain the slight discrepancy between my results and Mattei's (op. cit.) as regards the frequency of congestion.

In the greater part of the cases *medullary hæmorrhage* existed as a central black-red band of blood separating the walls, or as fluid blood filling out the organs. In 3 cases the hæmorrhage was *limited*.

In one of these (38) the organ (left) was of normal size, the walls were not separated, or but to a slight extent, and three small hæmorrhages of a black-red colour, varying in size from a grain of rice to a small pea, were found in the substance of the medulla (Pl. V, fig. 2); on the right side the organ was full of fluid blood. The case was a footling delivered by traction through a much contracted pelvis, the right side being pressed by the jutting promontory.

In the second case (52) the left supra-renal had its lower half only distended with blood. It also was from a case of contracted pelvis, and was delivered by cephalotripsy, the uterus having been for a long time tightly contracted around the body of the child.

The third case (89) showed hæmorrhage into both organs at the upper part. It was a breech presentation, and the head was delivered with difficulty by a midwife.

Microscopic examination of a supra-renal capsule in an

early stage of apoplexy shows the capillaries of the medulla widely distended by blood. The spaces containing the large medullary cells are in many cases flooded with blood which has escaped from the capillaries. Two or three large cells may be observed floating as it were in a pool of blood, and in their interior may be seen red corpuscles in the act of discharging their colouring matter, which adheres to the periphery of the corpuscle as minute yellowish beads, and gives a yellowish-brown colour to the medullary cells (Pl. IV, fig. 2).

In more advanced cases of hæmorrhage large masses of blood corpuscles are found collected in the central portion of the organ.

INJURIES TO THE LUNGS (see Table V).

Excess of fluid was found in the pleura in 14 cases, in 9 of which the fluid was either stained with blood or was nearly pure blood. The blood had usually escaped from the surface of the lung.

Congestion in some part of the respiratory tract (larynx, trachea, or lungs) was found in 36 cases. The larynx is specially noted as congested in 2 cases of face presentation, in 3 forceps deliveries, in 2 natural vertex, and 1 breech presentation. The congestion of the lungs is most frequently met with at the lower lobes, and especially at their thin edges.

Hæmorrhage was observed in 43 cases.

It occurred as sub-pleural petechiæ or hæmorrhages in 25 cases = 19·23 per cent.

It occurred as hæmorrhage into the lung-substance in 23 cases = 17·7 per cent.

Sub-pleural petechiæ ("Tardieu's spots") may exist at any part of the surface of the lungs or between the lobules. Hæmorrhage into the substance of the lung may also occur at any part; but its most frequent site is the base, and particularly the thin lower edge; it may also

occupy the greater part or the whole of one lobe, or the lung on one or both sides.

The thin lower edge, when affected with hæmorrhage, has a black appearance; the apoplectic portion is usually about a quarter to half an inch in width, and extends for a variable distance along the edge. When a lobe is affected the organ is black-red or dark bluish-red in colour, heavy, liver-like, and friable to the feel, and exudes blood on pressure. When an extensive area is injured the rib-marks can sometimes be seen as paler streaks on the dark-red surface, and hæmorrhage then often occurs extensively beneath the serous covering, and sometimes it bursts into the pleural cavity.

On three occasions the hæmorrhage occurred at the apex of the lung—all three cases of difficult delivery by the breech.

The mode of delivery of the 23 cases of intra-pulmonary hæmorrhage was as follows:

By the head, 6 (only 1 normal, 2 having large bellies, 1 being a first twin, and 1 being forty-eight hours in delivery).

By the breech or feet, 10 (most with traction).

By podalic version, 2 (1 contracted pelvis, 1 placenta prævia).

By forceps, 3 (1 contracted pelvis, 1 placenta prævia, 1 prolapse of cord).

By cephalotripsy, 1.

By decapitation, 1.

It will thus be seen that breech and footling delivery greatly favour the occurrence of pulmonary hæmorrhage, the effect being probably due to incomplete dilatation of the parturient canal, to squeezing of the blood into the upper part of the body, to the direct pressure of the canal upon the thorax, especially when the arms are extended, and to traction in the trunk or limbs.

Case 16 is interesting as showing hæmorrhage into the substance of the lung on the presenting side in a neglected shoulder presentation (see Abstract).

Microscopic examination of the thin edge of the lung affected with apoplexy shows the pleura raised up by blood effused beneath it and into its substance ; hæmorrhage is also seen extending along the fibrous septa of the lung and in the loose sheath of the larger vessels. The capillaries are greatly gorged with blood, and in places appear to be ruptured. Hæmorrhage has also occurred into the alveoli and into the smaller bronchioles (Pl. VII, figs. 1—3).

These pulmonary apoplexies appear to be of the greatest importance, and to be the cause of many deaths in children in the first few days after birth ; they will undoubtedly give rise to pneumonia, as in Case 2. The children who are the subject of them are usually cold and blue (2, 31), with a subnormal temperature, whining, and refusing the breast ; as physical signs I have found dullness, weak breath-sounds, and bubbling râles. I believe the death is sometimes attributed in these cases to congenital heart disease, the real cause of the cyanosis having been overlooked.

INJURIES TO THE TESTIS AND SPERMATIC CORD (see Table VI).

Congestion of the testis, scrotum, or spermatic cord was observed in 37 cases, which number does not include those in which a *slight* amount of congestion of the scrotal tissues occurred.

Hydrocele of the tunica vaginalis was met with six times.

Hæmorrhage into the testis occurred in 15 cases, that is, in 19·23 per cent. (of the male children). The hæmorrhage occurred :

Into the whole of both organs	. 9 times.
Into the whole of one organ .	. 3 „
In scattered patches in the right organ	1 „
In the mediastinum testis .	. 2 „

Hæmatocele of the cord occurred in 5 cases.

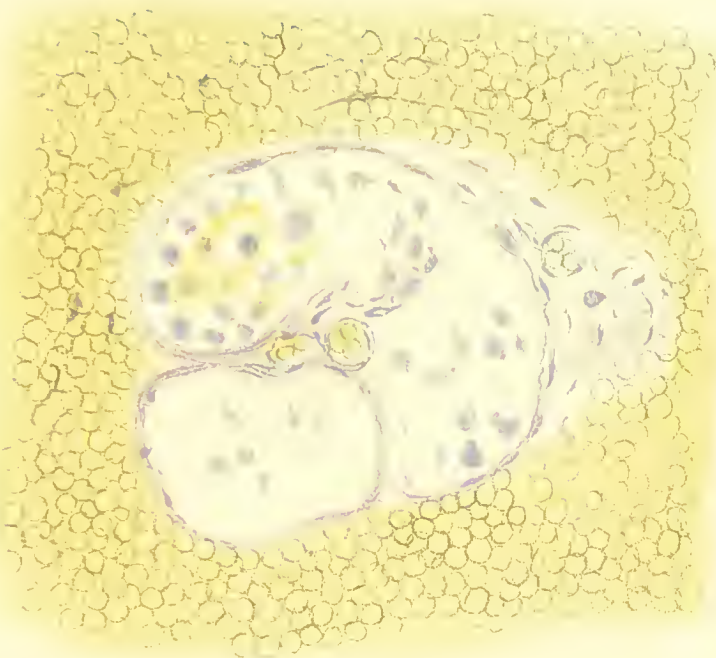
Hæmatocele of the tunica or processus vaginalis in 3 cases.

DESCRIPTION OF PLATE VI.

Illustrating Dr. Herbert Spencer's paper on Visceral
Hæmorrhages in Still-born Children.

Fig. 1, CASE 6 (see also Plate V, fig. 3).—A microscopic section of a lobule of the testis, showing the lobule surrounded and apparently compressed by effused blood. The cells lining the seminiferous tubules appear to be disorganised, take the logwood stain but feebly, and have fallen out in places. (*High power.*)

FIG. 2, CASE 6 (see also Plate V, fig. 3).—A microscopic section of a loop of the epididymis, with (normal) dense connective tissue around it. The columnar epithelial cells are healthy and take the stain well. The hæmorrhage (which was small in amount; see Plate V, fig. 3) is not shown in the figure. (*High power.*)



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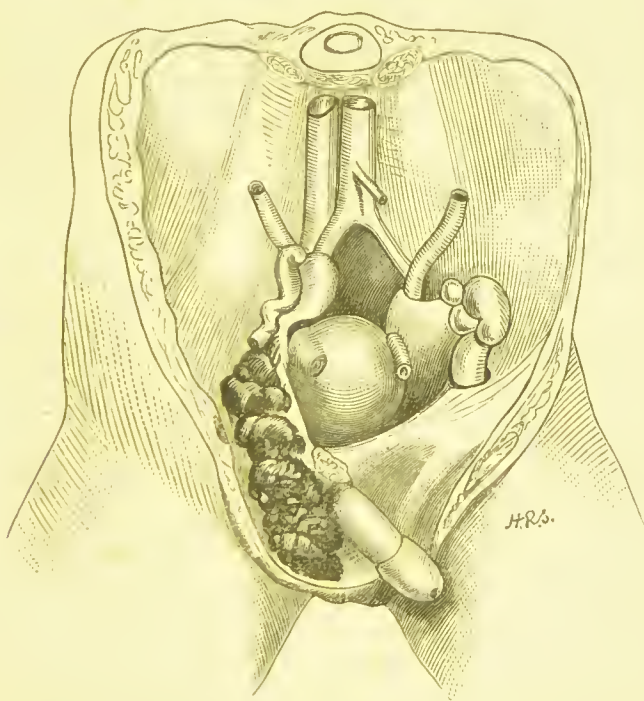


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Of the 15 cases of hæmorrhage into the testis I have notes of the delivery in 14, as follows:

As breech or footling	. 8 cases (6 with traction).
As vertex	. 1 „
As (?) face	. 1 „
By forceps	. 3 „
<i>Conduplicato corpore</i>	. 1 „

From this table it will be seen that breech and footling deliveries greatly favour hæmorrhage into the testis. The healthy spermatic cord in the new-born child is seen as a thin black-red streak of the thickness of twine passing down into the scrotum. Under difficult delivery (particularly by the breech) this cord may swell until it attains the size of a crow-quill or even more; often the cord on one side is fuller than the other.



Hæmorrhage into the processus vaginalis and cord, in a case of right footling presentation delivered by traction (Case 58).

In certain rare cases (6, 18, 58, 127) an effusion of blood may take place into the tissues of the cord, attaining

the size of a peeled almond, or extending the whole length of the cord, or filling up the processus vaginalis [as shown in the above Woodcut]. Under the microscope the loose tissue of the spermatic cord is seen to be everywhere infiltrated with blood, and the veins to be greatly distended. This grave injury may possibly explain certain cases of non-descent of the testicle when it occurs before the organ has left the abdomen (as in the museum specimen exhibited).

The healthy testis of a new-born child is a small lilac-grey organ, nearly a centimetre long and half a centimetre broad. On cutting into it the section is of a dark pink colour.

When the organ is congested, or has blood effused into it, the colour of the *tunica albuginea* becomes much darkened till it may assume a dark-blue aspect, and sometimes enlarged veins may be seen just beneath the surface. On section the testis is then found to be of a dark brown-red, black-red, or even quite black colour (according to the amount of blood effused), and the cut surface bulges from the capsule. In some cases the hæmorrhage will be found in small scattered patches; in others it radiates in the mediastinum. Often the brown-red streaks seen in the mediastinum are merely dilated vessels without actual effusion. In some cases it can be observed with the naked eye that the blood is collected mainly under the tunica albuginea; this is usually very obvious to the naked eye on holding a microscopic section to the light.

The epididymis is much less affected by congestion or hæmorrhage, probably owing to its denser structure. On microscopic examination with a low power there is found great congestion of, and hæmorrhage into, the hilum of the testis, and blood is effused extensively into the connective tissue of the body of the gland (Pl. V, fig. 3). The colouring matter of the blood collects beneath the capsule as an orange-coloured deposit, and in places, in the body of the organ, it shows a tendency to crystallise. Congestion of, and hæmorrhage into, the epididymis is also found; but the injuries to this structure are strikingly less than those of the testis.

DESCRIPTION OF PLATE VII.

Illustrating Dr. Herbert Spencer's paper on Visceral
Hæmorrhages in Still-born Children.

FIG. 1, CASE 47.—A microscopic section of the thin edge of the lower lobe of the lung, showing extensive hæmorrhage beneath the pleura and into the substance of the lung. (*Low power.*)

FIG. 2, CASE 47.—A microscopic section showing hæmorrhage into the alveoli of the lung. (*High power.*)

FIG. 3, CASE 47.—A microscopic section showing hæmorrhage around and into a bronchiole. (*High power.*)



Under a high power the whole section of the testis is permeated with red blood-corpuscles, and the lobules of the gland appear to be compressed by the effusion and their cells are distorted, indefinite in outline, and are falling out in places (Pl. VI, fig. 1). Occasionally blood-corpuscles are intermingled with the cells of the gland.

The cells lining the epididymis are, on the other hand, unaltered by the small amount of blood effused in the dense surrounding tissue (Pl. VI, fig. 2).

INJURIES TO THE UTERUS, &c. (see Table VII).

Congestion of the uterus occurred thirteen times. It is usually seen as fulness of the sub-peritoneal vessels of the uterus, but also occurs in the mucous membrane of the body or cervix, and sometimes in the ovaries and tubes.

Hæmorrhage into the uterine tissue was met with five times (twice into the mucous membrane of the body or cervix, and three times into the sub-peritoneal tissue and into the superficial parts of the organ). Two of these 5 cases were delivered as normal vertex cases and, one of them weighed only 1 lb. 7 oz., the other child was suffering from septicæmia, which was the cause of the effusion. The remaining 3 cases—the only ones in which hæmorrhage occurred into the mucous membrane of the body—were all difficult breech cases.

Hæmorrhage into the cellular tissue around the orifice of the vagina and into the labia was noted in 2 cases, both born with difficulty by the breech.

Under the microscope I have been able to demonstrate hæmorrhage into the sub-peritoneal cellular tissue and the loose fibro-muscular tissue at the surface of the uterus, but I have not succeeded in showing the hæmorrhage into the mucous membrane, even in cases where blood could be seen with the naked eye oozing into the cavity of the organ from the mucous membrane, which was of a black-red colour for a depth of $\frac{1}{3}\frac{1}{2}$ in. The difficulty of showing hæmorrhage in this situation in new-born children depends

partly upon the tissues not being absolutely fresh, and partly upon the rapidity with which the corpuscles lose their colouring matter and break up into a granular *débris*.

INJURIES TO THE SPLEEN (see Table VIII).

Congestion was noticed in 21 cases, in 4 of which it was intense, even to blackness; in one of these it was disseminated, in the others diffuse.

Hæmorrhage was found in 3 cases only. One of these (61), a natural vertex presentation, died convulsed three hours after birth. In the second (102) there was great general congestion of the organ, and in two places the capsule had been raised up by effusion of blood beneath it [Pl. VIII, figs. 2 and 3]. The child presented by the vertex, and died suddenly fifteen minutes after the establishment of respiration. The third case (127) was a face presentation, and there was extensive hæmorrhage into the substance of the spleen (Pl. VIII, fig. 1) and also beneath its capsule on the inner and outer surface.

Microscopic examination showed the whole organ packed with red blood-corpuscles, not the smallest space being free from them. They were less abundant in the Malpighian bodies on account of the closer texture; but they could also be seen there on careful examination. Under the capsule the blood has collected in several places, and the blood-colouring matter has a great tendency to accumulate there. Cases 61 and 127 also show beautifully the crystallization of the hæmoglobin in the central portions of the organ.

The rarity of splenic hæmorrhages—3 cases out of 130—may probably be explained by the small size, deep position, mobility and distensibility of the organ. I may here, however, mention that I have twice in stillborn children found spleens measuring three inches in length and quite free from hæmorrhage.

DESCRIPTION OF PLATE VIII.

Illustrating Dr. Herbert Spencer's paper on Visceral
Hæmorrhages in Still-born Children.

FIG. 1, CASE 127.—A section of a spleen (preserved in spirit) showing hæmorrhage into the substance of the organ. The whole organ is suffused with blood, the pale middle band being the part least affected. The dark outer band is full of blood corpuscles with their colouring matter. The darkest (central) portion contains a large quantity of hæmoglobin crystals. *Nat. size.*

FIG. 2, CASE 102.—A spleen (preserved some days in spirit) showing two hæmorrhages beneath the capsule. *Nat. size.*

FIG. 3.—A section through the same specimen (fig. 2) showing the thickness of the effused blood. *Nat. size.*

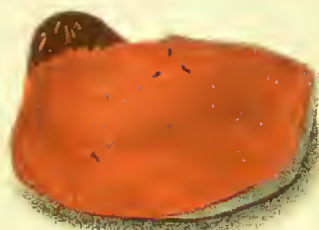
FIG. 4, CASE 107.—The colon and ileum showing extensive effusion of blood (clotted) into the wall and lumen of the cæcum, and two small sub-peritoneal hæmorrhages on the ileum. (The hæmorrhage into the cæcum produced intestinal obstruction, from which the infant died on the fourth day.)



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INJURIES TO THE STOMACH.

The stomach was examined in 66 cases only. It usually contained mucus and often, in addition, a curdy-white or flocculent material, sometimes bubbles of air, and occasionally meconium. The summits of the rugæ were often marked out by rows of little red points; but well-marked congestion was rarely found (117). In 5 cases there was blood in the cavity of the organ (2, 31, 69, 105, 108). In 4 of these the blood had apparently been swallowed, having come from the lungs; none of these were stillborn. In the fifth case (cephalotripsy) the blood had apparently flowed into the stomach from the crushed base of the skull. In only 1 case was there apparent disease of the mucous membrane (31). In this case (which was delivered by the breech and lived four days) there were numerous little ulcers of the size of No. 6 shot scattered over the lining membrane. Of the 5 cases in which the stomach contained blood, 3 were breech or footling deliveries, 1 a natural vertex, and 1 a case of cephalotripsy.

INJURIES TO THE INTESTINES

The œsophagus was examined in nearly all cases. Congestion, especially of its upper or lower end, was common, but no hæmorrhage was found.

The duodenum was several times observed to be greatly congested, of a dark brown-red or black-red colour. In 1 case (117) there was hæmorrhage into the mucous membrane, and the blood had escaped from its surface in sufficient quantity to stain the pulpy contents a red-brown colour. In two or three instances there was found intense congestion of, and hæmorrhage from, the mucous membrane of the jejunum and ileum, usually in several distinct places; the escaped blood was generally mixed

with the intestinal contents. The large intestine was affected with apoplexy in 1 case only (107). In this case the extravasation had occurred into the wall of the cæcum, and had then burst through the mucous membrane and filled the cæcum and adjacent part of the ileum (Pl. VIII, fig. 4). The blood was clotted and completely obstructed the gut. Two subperitoneal hæmorrhages of small size were found on a coil of small intestine which lay near the cæcum. The mother of this child was a multipara; the labour lasted forty-eight hours, the membranes having been ruptured many hours before delivery. The infant vomited meconium a few hours after birth, and at intervals, on eight occasions, until its death on the fourth day. No swelling could be detected by abdominal examination; neither did the finger feel anything abnormal in the rectum, but it was stained with a spot of blood. A small enema was followed about an hour later by the passing of a little meconium; but the child continued to vomit at long intervals, and died on the fourth day.

In this case the prolonged labour had probably caused the hæmorrhage by pressure against some part of the parturient canal.

Intestinal obstruction, due to hæmatoma of the intestine, has I believe not hitherto been described. A case of hæmorrhage in the cæcum has been reported by Dorrington (op. cit.).

Other pathological conditions found were excess of serum (or even blood) in the peritoneal cavity in several cases, retro-peritoneal and mesenteric hæmorrhage or congestion of the peritoneum. In no fresh stillborn child was actual peritonitis observed.

INJURIES TO THE HEART.

Sub-pericardial petechiæ and hæmorrhages were frequent. In 3 cases (57, 123, 130) there were found curious

little hæmorrhages into the valves of the heart, which were thicker and redder than normal. The hæmorrhages were situated near the free edge of the valve, and looked like small black shot embedded in its substance. Twice they affected the tricuspid and mitral and once the pulmonary valves.

INJURIES TO THE THYMUS, THYROID, SUBMAXILLARY, AND PAROTID GLANDS.

These organs were congested in many cases.

In the thymus sub-capsular hæmorrhages are not rarely found ; in one case hæmorrhage had occurred into the substance of the gland.

The *parotid gland* was found to be the seat of extensive hæmorrhage in 2 or 3 cases. A careful dissection of the gland in one of these showed the facial nerve to be firmly embedded in the part of the gland into which hæmorrhage had occurred. This effused blood would evidently produce considerable pressure on the trunk of the facial nerve, and I believe that in this way is to be explained the production of many cases of facial paralysis in the new-born child. I found this parotid hæmorrhage very copious in a case in which one blade of the forceps had (as is so commonly the case) embraced the parotid region.

INJURIES TO THE SKIN, SUBCUTANEOUS TISSUE, AND MUSCLES.

Hæmorrhage into the skin and subcutaneous tissue was found in many bodies. Thus, in the scalp, it almost always occurred to a greater or less extent ; bruises produced by the forceps were several times met with. In the arms it was observed as the result of pressure during version ; in the trunk as the result of gripping by the cervix, and very commonly in the lower extremities when

traction had been made by the leg, under which condition it is rarely absent.

Hæmorrhage into the muscles was frequently observed, most commonly into the muscles of the lower limbs in cases of traction by the leg, into the muscles of the buttock (in breech presentation and version), into the muscles of the trunk, and chiefly into the erector spinæ and pectorales (in bodies which had been gripped by the cervix or the hand of the attendant), and into the superficial and deep muscles of the neck. Of these muscular lesions the most interesting is *hæmorrhage into the sterno-mastoid*.

This injury I found in 8 bodies (48, 63, 85, 91, 95, 98, 116, 128); in 4 it occurred on the right side and in 4 on the left. The weight of the children varied from 14½ oz. to 8 lbs. 2 oz. Six were delivered with difficulty by the breech or feet, 1 was a natural vertex delivery, and 1 was delivered by the forceps. In all the 6 cases delivered by the lower extremity traction was employed; of the natural vertex case I have no note of traction; perhaps it was used, as accidental hæmorrhage occurred in the mother. The case delivered by the forceps had the hæmorrhage into the lower part of the left muscle, and it was due to pressure upon and stretching of the muscle by the point of the forceps-blade, the skin being bruised in the same situation, while the omo-hyoid muscle underlying it was uninjured.

Hæmatoma of the sterno-mastoid is an injury of much importance; it is met with in young children, not uncommonly as an indurated swelling of the muscle, generally known as a "sterno-mastoid tumour," and it is the cause of temporary, and probably also of permanent, wryneck. It has attracted the attention of many observers (see Tordeus, op. cit.), and it is probably usually due to great stretching of the muscle during delivery, particularly when traction on the child's shoulders is employed; sometimes it is caused by pressure by the blade of the forceps, and occasionally it occurs in cases of natural vertex delivery.

PART IV.

THE CAUSES OF THE VISCERAL HÆMORRHAGES IN STILLBORN CHILDREN.

The hæmorrhage must have as cause one or more of three factors :—(1) Thinness and weakness of the wall of the blood-vessels. (2) Alteration of the blood rendering it more prone to escape. (3) Increased blood-pressure from (a) asphyxia or other vaso-motor disturbance or from pressure on veins, (b) squeezing of blood into some parts of the body in the act of birth, (c) external violence rupturing the vessels at the point pressed upon.

1. *The vessel-wall*.—If we look at the list of organs in which hæmorrhage occurs we shall find this most frequent and most severe in those viscera which contain a large quantity of delicate vessels (meninges, liver, lungs, kidneys, suprarenals) ; that in these same organs the hæmorrhage is most frequent and most severe where the vessels are most numerous and most delicate, and but feebly supported by the surrounding tissues. It is also observed that with equal difficulty of delivery the hæmorrhage is apt to be more severe the younger the foetus is, that is to say, the more delicate is the structure of the vessels and surrounding tissues. We cannot doubt then that the delicacy of the walls of the capillaries and small vessels is an essential factor in the causation of these hæmorrhages. My observations are as yet incomplete on the question as to whether syphilis so weakens the vessels in new-born children as to lead to escape of blood from them. I have, however, observed a case in which the mother was the subject of recent syphilis, and the child presented the characteristic bone-lesions of the disease, and yet there was no hæmorrhage. Moreover, I have not succeeded in finding in the apoplectic areas evidence of vascular syphilis. That syphilis *alone* does not cause the effusions

is obvious from their frequency and the sites at which they occur. Indeed, given a difficult labour, the position of the hæmorrhages may be inferred with some certainty. The great probability is that syphilis has no influence in causing the apoplexies under discussion. That a general disease allied to septicæmia can in young infants produce hæmorrhages is well known. But in the stillborn children under discussion there is no evidence of such a general disease, the lesions are essentially localised, and I regard the normal delicacy of the fœtal vessels as the one essential feature in the causation of hæmorrhage. A single glance at a microscopic section of a congested fœtal organ, such as the lungs, is sufficient to excite our wonder that hæmorrhage does not occur in every instance, so exquisitely fine is the line of the capillary-wall.

2. *Alteration of the blood* rendering it more prone to escape. In the absence of evidence of such alteration, and in view of the facts that the blood corpuscles escape in bulk from the vessels, and that the hæmorrhages are localised, this cannot be admitted as a cause or, at least, not as an immediate cause of the hæmorrhage.

3. *Increased blood-pressure.*—(a) *from asphyxia.* This condition which has generally been credited with the causation of the majority of stillbirths I believe to be on the whole rare as the immediate cause. True asphyxia I believe to be the "*asphyxia livida*" of authors, and of this instances are to be met with in the cases I have described. "*Asphyxia pallida*" I am inclined to believe not to be asphyxia at all, but to be really a state of syncope and shock, the result of hæmorrhage and injuries to the viscera.

That true asphyxia can occasion apoplexy we know quite well from observation of its effects upon the organs (chiefly the meninges) of adult subjects. That it is not the sole or indeed a frequent cause of the hæmorrhages in stillborn children may be inferred from observing that in many cases there is not, as a matter of fact, a single sign of asphyxia in the bodies; again, a child may be

born suddenly by a single pain, dead, and presenting numerous visceral hæmorrhages ; here there was not time for the production of asphyxia as usually understood. Moreover, there is the fact, that in the absence of all signs of asphyxia, pressure from without—either by instruments, the parturient canal, or the doctor's hand—may give rise to hæmorrhage at the part pressed upon.

Again, I have seen children born easily, in a state of the most intense livid asphyxia (in cases of prolapse of the cord, congenital disease of the heart, &c.), and showing no hæmorrhages on post-mortem examination. It may, I think, also be stated generally that where the labour is easy, in spite of asphyxia in the child, the hæmorrhages will be absent or of slight degree. It is, moreover, a daily experience to find children born profoundly asphyxiated, but alive, and easily in a few minutes provoked to healthy and vigorous life. Many of the children described in the foregoing pages have shown no clinical sign of asphyxia just before birth, and yet have been born dead and showing visceral hæmorrhages.

If we consider, on the one hand, the force which the uterus exerts on the body of the child—sufficient to paralyse the arm of a strong man ; and on the other hand, the softness and delicacy of the infant's tissues and the readiness with which it resents the slightest injury ; I think it far more reasonable to attribute the death, in cases in which there is hæmorrhage, to shock as a result of the injuries to the viscera than to asphyxia and asphyxia alone. When combined, however, with the other causes, asphyxia will no doubt render the hæmorrhages more frequent and more severe.

Besides the general condition of asphyxia it is possible that a vaso-motor influence is exerted on the viscera through the injuries to the central nervous system, but of this there is no clear evidence in the cases before us.

Pressure upon veins (*e.g.* jugular and spermatic) will cause a congestion of the distal area, and thus favour the

production of certain hæmorrhages, as in the brain and testicle.

(b). *Mechanical squeezing of blood into some parts of the body during the act of birth* is probably a frequent cause of hæmorrhage.

In labour, with the cervix undilated and the membranes ruptured, the general tendency of the uterine contractions will be to produce a determination of blood to the central organs of the child's body.

And, when the cervix dilates, the tendency will be partly to repress the blood towards that portion of the child which is contained in the body of the uterus, and partly to force it into the presenting part, on the principle of the formation of the caput succedaneum.

In cases of breech presentation this repression of blood will be greater on account of the small size and softness of the presenting part, and will be especially well marked where traction on the limbs is employed ; this traction has the hydraulic effect of forcibly driving the blood into the upper parts of the body, and explains the production of hæmorrhages into the apices of the lungs as well as (to some extent) into the meninges of the brain.

(c). *External violence rupturing the vessels at the point pressed upon.*

There are in the cases described in this paper many instances of this source of hæmorrhage, both in the limbs as the result of pressure by the hand of the accoucheur in making traction, and in the superficial and deep parts of the trunk and head from pressure by the hand, instruments, or parturient canal. It is difficult to convey in words a correct idea of the way in which this is produced in individual instances ; the explanation is usually easy with the child's body in one's hands. I will here merely mention, as instances, apoplexy of the lung produced by pressure of the rigid cervix on the child's thorax (the hæmorrhage occurring at the seat of pressure which was indicated by a deep livid band in the skin) ; hæmorrhage under the capsule of the liver in a case of breech

presentation with extended legs, from pressure of the thigh upon the subjacent organ; meningeal hæmorrhage, limited to the area over which the bone was depressible; and intra-cerebral hæmorrhage, limited to the part pressed upon by the point of the blade of the forceps.

PART V.

The following practical conclusions may, I think, be fairly drawn from a consideration of the foregoing observations:

I. In children stillborn or dying shortly after birth, congestion or œdema and hæmorrhages are usually found in various important viscera.

II. These hæmorrhages occur in cases delivered naturally or by version or forceps, in normal and abnormal pelves, with primiparæ or multiparæ, in large and small children, in "easy" and difficult, rapid and prolonged labours.

III. The hæmorrhages are, however, most frequent and most severe in children subjected to much pressure by the parturient canal, or instruments, or the hand of the attendant, especially when delivered by the lower extremity.

IV. Cerebral hæmorrhage is more frequently found in stillborn children delivered by the forceps than in those born by the breech, and in these latter more frequently than in those born naturally by the head.

V. Hæmorrhage into most of other viscera is more frequently met with in pelvic than in cephalic presentations.

VI. These hæmorrhages and the accompanying injuries are in many cases the cause of the stillbirth, and, when not immediately fatal, may be followed by the gravest consequences.

VII. They are most likely to be avoided by preventing premature rupture of the membranes, by artificial dilatation of the parturient canal (when necessary), by restricting the employment of version and other artificial manipulations to urgent cases, and by preferring cephalic to podalic version in cases suitable for the former.

VIII. The use of the forceps should be absolutely limited

to cases in which there exists some pressing danger to mother or child, and it should never be employed merely to shorten the time of labour.

IX. In breech presentations examination of the genital organs of the child should be carefully avoided during delivery. As soon as the child's limbs are born they should be wrapped in a thick layer of antiseptic wool (which keeps the child warm, and prevents the hand from slipping, and protects the limb from pressure). If traction is necessary it should be made over wool wrapped around the child's limbs or *pelvis*. It should never be made by the hand around the child's *waist*.

X. In delivering the after-coming head care should be taken that the sterno-mastoid muscles are not unduly stretched or pressed upon. In cases where the after-coming head is in the pelvis, where there is even slight difficulty, resort should be had to forceps to deliver.

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Dr. JOHN PHILLIPS testified to the enormous amounts of facts which were detailed in the paper, making the discussion of any particular portion very difficult. He noticed that Dr. Spencer enumerated, among the conditions tending to visceral hæmorrhage, thinness or weakness of the vascular wall. He would like to ask whether Dr. Spencer had ever met with a labour in a hæmophilic woman. Hæmophilia was essentially a congenital hæmorrhagic disorder, and although the condition of vascular wall leading to the hæmorrhage was at present not understood, yet it certainly would be one cause of visceral hæmorrhage. Dr. Phillips had himself never met with or read of such a case. He had observed two cases which were identical with those read by Dr. Spencer. The first case was a breech presentation with pelvic contraction, in which considerable force had been used to complete extraction, the two thighs being dislocated. At the necropsy the right lobe of the liver was found to be encroached upon by a large clot under its capsule. The second was that

of a child born quite naturally and easily, which began to vomit gummy blood immediately after birth, a condition which lasted up to its death forty-eight hours after. Dr. Phillips quite agreed with the author of the paper that many cases of so-called "asphyxia deaths" were really due to internal hæmorrhages.

Dr. HERMAN said that Dr. Spencer's paper was of the highest class, for it contained facts, and did not consist of speculations, opinions, or guesses. He did not know of any work upon this subject which contained such a large number of facts, and of such carefully observed facts as, this paper of Dr. Spencer's, which would add greatly to the value of the volume of 'Transactions,' in which it would appear. Those present at this meeting were additionally indebted to Dr. Spencer, not only for his laborious collection of facts, and his able analysis of them, but for the remarkably beautiful collection of specimens, microscopic sections and drawings with which he had illustrated his paper, and enabled those present to convince themselves of the accuracy of his descriptions. It was not possible to controvert Dr. Spencer's facts, but as to one of his inferences from these facts, he (Dr. Herman) ventured to differ from him. Dr. Spencer said, in conclusion of his abstract, that the forceps "should never be employed merely to shorten the time of labour." He (Dr. Herman) thought that perhaps the commonest indication for forceps was weakness of the pains in the second stage of labour. In cases in which there was no pelvic deformity, nor disproportion between the child's head and the pelvis, the os uteri was fully dilated, and delivery was slow, simply because the pains were too weak to quickly overcome the resistance of the pelvic floor, so that the second stage, if aid were not given, would last four or six hours, or more. It might be correctly said that the forceps was employed "merely to shorten the time of labour." He thought that the use of forceps in cases of this kind was good practice, and that if the instrument were used with proper care and skill, evil results did not ensue from it. He thought that if we were able to ascertain the practice of accoucheurs all over the country, we should find that the forceps was used oftener on account of the condition he had described than for any other indication, and that those who so used it did not find that it harmed the child. He gathered that Dr. Spencer did not think that the proper and skilful use of the forceps was so very injurious, for he recommended this mode of delivery when the after-coming head was delayed, and he (Dr. Herman) quite agreed with him in this recommendation. Each obstetrician would be more skilful in the mode of delivery of the aftercoming head which he more frequently practiced; and his preference, like Dr. Spencer's, was for the forceps. Dr. Spencer's dissections brought out the fact that injuries to the brain were most common in children delivered with forceps than in children delivered naturally. Dr. Herman

thought that this fact probably signified that the forceps was used in the worst cases, so that the injuries were due, not to the forceps, but to the conditions which had made forceps delivery necessary, as in Cases 3, 28, 34, 60, 79, 84, in Table I.

Dr. PETER HORROCKS related three cases in which, after podalic version and delivery by traction, the children had made no attempt at respiration, although the heart was beating. In one of these, an attempt was made to catheterize the trachea, but the catheter passed down the œsophagus, and the stomach was filled with air, so tracheotomy was performed, and the child's heart was kept beating for an hour and a half. Before tracheotomy the pulse had fallen to ten per minute, afterwards it rose to 130 per minute, and finally decreased slowly in rate until it stopped. During all this time no effort whatsoever at respiration was made by the child, and on making a *post-mortem* examination hæmorrhage into the fourth ventricle of the brain was found. In the other two cases there was also hæmorrhage into the fourth ventricle, and in one of them on the surface of the brain also. Dr. Horrocks had considered the total absence of all efforts at respiration to be due to pressure on, or damage to, the respiratory centre in the medulla oblongata or bulb. In conclusion, Dr. Horrocks asked what was meant by œdema of the cord.

Dr. DAKIN thought that this very interesting paper had, in addition to its purely obstetrical aspects, an important bearing on infantile life and infantile diseases. The conclusion was obvious that if hæmorrhages occurred so universally in stillborn children and those dying soon after birth, as was shown to be the case in Dr. Spencer's most valuable paper, and if they occurred in cases where labour had been natural, they must also occur very frequently in children who survived, and subsequently reached maturity, especially if labour had been difficult. In the latter cases the hæmorrhages might be numerous or large, or both, and if they were situated in tissues that were not vital, such as the muscles and cellular tissue, especially the subcutaneous cellular tissues, they would not very materially affect the child's welfare. He asked if Dr. Spencer agreed with some other authorities in the opinion that these extravasations were a cause of the milder cases of infantile jaundice, by the absorption of their blood-pigment into the general circulation, and consequent staining of the tissues. Dr. Dakin noticed that out of twelve or thirteen cases in the tables which survived only three days, only two were jaundiced. More interesting still, however, were the congestions and hæmorrhages described as existing in the uterus and its lining membrane and in the intestines in so many cases. They offered a possible explanation of the bleeding which sometimes occurred from the vagina of females and the rectum of male children within a few days of birth. This phenomenon, especially in female children, was not uncommon, and numerous hypotheses

had been advanced to account for it, none of which were supported by anatomical evidence. This subject had been very fully dealt with in a paper by Dr. Cullingworth in the 'Liverpool and Manchester Medical and Surgical Reports,' vol. iv.

Mr. ALBAN DORAN said that Dr. Dakin had rightly turned attention to the question as to what occurred when the child was not stillborn but survived. The hæmorrhages might not kill, but they might set up visceral and other diseases. Large subcutaneous extravasations of blood caused by violent blows were sometimes followed by the development of a sarcoma. Mr. Doran had observed a case of sarcoma following a blood-tumour which developed in the shoulder of a woman almost immediately after a blow. Malignant changes commenced a few months later. He knew of a very similar case where the shoulder was struck by the sash of a window. Possibly sarcoma in infancy might sometimes develop in the same manner in association with these hæmorrhages. Thus Dr. John Phillips's case of congenital sarcoma in a new-born infant ('Transactions,' vol. xxx, 1888, pp. 301, 334) might have arisen in an extravasation of blood due to congestion from some fœtal disease or injury.

Dr. LEWERS suggested that some morbid condition of the vessels might have caused the hæmorrhage in some of the cases. Considering the fact that so many children that afterwards thrive had been delivered by forceps, it seemed improbable that the forceps, skilfully used, would often cause visceral hæmorrhage in healthy fœtuses.

Dr. HERBERT SPENCER, in reply, thanked the Society for the manner in which his paper had been received. As regarded the use of the forceps, he did not think the question could be settled by an appeal to practice, if only for the reason that the frequency with which it was employed varied extremely with different practitioners. Neither could the matter be decided by statistics of stillbirth, it being well known that children with meningeal hæmorrhage often died of the injury some hours or days, or even weeks, after birth, or they might survive with subsequent paralysis. He thought that many slight muscular or mental disabilities in after life might have their origin in these injuries. Careful observation of the after-history of difficult forceps deliveries was very desirable; meanwhile he regarded the constant occurrence of meningeal hæmorrhage in the cases he had recorded as a significant fact which told against the frequent employment of the instrument. It would be seen, on referring to his paper, that, in at least some of the cases, the injury was due directly to the forceps, and not to the condition which called for its employment. Considering the injuries that the instrument was capable of inflicting on the child (to say nothing of the mother), he thought it should not be used without definite indications, either on the part of the mother or child. It was impossible to be sure, even in the

simple case supposed by Dr. Herman, that the forceps was absolutely harmless. He (Dr. Spencer) recommended the application of the forceps to the after-coming head (when it was in the pelvis and there was difficulty in extraction) as the most rapid and efficient method of saving the child from death by asphyxia; he had known it succeed in delivering the after-coming head of a second twin after traction had failed. The forceps, when applied to the after-coming head, was free from some of the dangers (such as pressure on the neck) which attended its employment to the fore-coming head, and by producing flexion it saved the sterno-mastoid muscles from injury. He could only explain Dr. Galabin's assertion, that sterno-mastoid tumour had not been seen by him after delivery of the after-coming head by traction, by supposing that it had not been specially looked for. From personal experience he could say that it was a common result of such traction, although wry-neck was sometimes slightly marked or even absent. He had seen cases similar to that described by Dr. Horrocks, and had found hæmorrhage around the medulla. He had expected in some of the cases of respiratory paralysis to find hæmorrhage into the medulla in the situation of the vaso-motor respiratory centre, but had not succeeded. On the other hand, he had found hæmorrhages scattered through the substance of the medulla in an anencephalic fœtus, which breathed for three quarters of an hour. He did not approve of the performance of tracheotomy in Dr. Horrock's case; he would have preferred to pass a catheter into the trachea. This he had done in upwards of fifty dead and in several stillborn fœtuses, and, although it was not often necessary, he considered it an easy and extremely valuable means of resuscitation. He thought that the majority of cases of jaundice in new-born children were due to changes in the colouring matter of extravasated blood, a view already propounded by Zweifel. The question of the after-history of children which survived these visceral hæmorrhages was, he thought, highly important. Several detailed observations on children which survived a few days would be found in the paper he had read; but he hoped that other observers, with greater opportunities, would multiply and extend them. In respect to Dr. Dakin's observations on jaundice, Dr. Spencer pointed out that the records in his paper were complete only as regarded congestion and hæmorrhage, and not as regarded icterus.



